Jazz Music: The Technological Mediation of an Aural Tradition

by

Brent Jarvis

Associate in Music Diploma (Jazz), Vancouver Island University, 1998.

Bachelor of Music in Jazz Performance (with Honours), University of Toronto, 2002.

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We acknowledge with respect the Lekʷəŋən peoples on whose traditional territory the university stands and the Songhees, Esquimalt and W̱SÁNEĆ peoples whose historical relationships with the land continue to this day.

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Abstract

Jazz music is transmitted by aural and oral means. As recording and broadcast mediums became increasingly ubiquitous, starting in the mid twentieth-century, an ever greater proportion of jazz's aural transmission would be mediated by these developing technologies. Many commentators address sound's mediation from one state to another by identifying the resulting recording as an object. This object transcends temporal and spacial proximity, possessing inherent authority with implications for authorship, related work-concepts, and even issues of cultural assimilation. From a perspective informed by writings in musicology, philosophy, and sound studies, I examine recorded jazz music from the twentieth-century.

I begin by positioning the history of jazz music in relation to the emergence of recording technologies to establish recordings as authoritative texts. I then translate (by transcription) primarily non-literate jazz recordings into the primarily literate discourse of musicology. In the course of examining music by James Moody, Eddie Jefferson, Bud Powell, Chick Corea, and others, I conclude that they all exemplify musical intertextuality. In some cases, technological mediation connects the texts.

I then turn to an examination of recordings specifically. I begin by questioning musical notation as an adequate description of sound and move to developing a broader analytical framework. This thesis culminates with a comparison of Bud Powell's 1949 recording of *Bouncin' With Bud* and Chick Corea's 1997 recording. Using the framework mentioned, disparate potentialities afforded by each recording's mediation are connected to musical characteristics.

Table of Contents

List of Tables

List of Figures

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Chapter 1 - Introduction

Jazz music is transmitted primarily through aural and oral means. Although written scores and lead-sheets exist, they generally convey only a basic outline to be interpreted and embellished by a jazz musician. For example, the sheet music to Jerome Kern's 1933 composition *Yesterdays*, is seen to convey little information about the music when compared to Art Tatum's 1949 recording of the piece.[1] Few of the melodic, harmonic, and rhythmic characteristics of this performance were notated nor are attributable to Kern. Despite Barry Ulanov's assertion that: "You can't imitatum!,"[2] subsequent performances of *Yesterdays,* including the recordings in 1950 by Charlie Parker[3] and Bud Powell,[4] the 1952 recording by Miles Davis,[5] and numerous others, exemplify Tatum's influence.

As early jazz predated the widespread emergence of recording and broadcasting technologies, this ephemeral music was heard only by listeners within physical and temporal proximity. In 1939 Charlie Parker worked as a dishwasher in Jimmie's Chicken Shack in New York City where Art Tatum played the piano.[6] Exposure to Tatum's music is thought to have been critical to the course Parker took in revolutionizing jazz in the 1940s.[7] As recording and broadcast mediums became increasingly ubiquitous in the 1950s, '60s, and onward, however, an ever greater proportion of jazz's aural transmission would be mediated by these developing technologies. My thesis aims to complement existing understandings of jazz music by integrating an analysis of its technological mediation. That is, I aim to understand the intermediary processes that exist between two states: live performance and recorded music.

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[1] Art Tatum, *Gene Norman Presents an Art Tatum Concert,* recorded May 1949 at the Shrine Auditorium in Los Angeles, Columbia Records GL101, 1952, 10 inch LP.

[2] James Lester, *Too Marvellous For Words: Life and Genius of Art Tatum,* (New York: Oxford University Press, 1994), 135.

[3] Charlie Parker, *Charlie Parker Sextet,* Dial Records 207, 1950, 10 inch LP.

[4] Bud Powell, *Jazz Giant,* Norgran Records MGC 507, 1950, two 10 inch LPs.

[5] Miles Davis, *Chance It* / *Yesterdays,* Blue Note Records 1596, 1952, 78 RPM record.

[6] Jeffrey C. Ward, *Jazz: A History of America's Music,* (New York: Random House, 2000), 308.

[7] Barry Ulinov, *A History of Jazz in America,* (New York: Viking Press, 1957), 225.

My analysis considers the implications resulting from the technological transmission of messages and cultural values.[8]

Fundamental to my thesis is the acknowledgment that recordings and broadcasts are distinct from live music performances. The improvised and un-notated jazz performance is transformed into an object. By examining recordings of jazz music from the twentieth-century, I will connect the potentialities of recording and broadcast mediums to musical characteristics. My thesis argues for integrating several forms of research and analysis when investigating historical transmission of jazz.

Many of the assertions made in this thesis relate to Marshall McLuhan's argument that "societies have always been shaped more by the nature of the media by which [people] communicate than by the content of the communication."[9] I also draw upon theories that add nuance to McLuhan's ideas. My approach advocates a less absolute nor binarized position than McLuhan's, that societies have always been shaped by the nature of the media through which people communicate and vice-versa.

In positing a history of sound, Jonathan Sterne states that: "Reproduction technologies are artifacts of vast transformations in the fundamental nature of sound… sound itself became an 'object.'"[10] Music now exists independent of physical and temporal proximity. Recording and broadcast technologies have separated sound from its source. This separation is described by Murray Schafer as "schizophonia."[11] Addressing this separation, with a nod to Pythagoras and his acousmatic disciples, Pierre Schaeffer defines "a noise that one hears without seeing what causes it" as an acousmatic sound, "a sonorous object, independent of any causal reference."[12] The reduction (or separation) of sound from source subverts a

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[8] *Blackwell Encyclopedia of Sociology,* s.v. "Mediation," accessed June 21, 2021, https://doi.org/10.1002/9781405165518.wbeosm072.pub2.

[9] Marshall McLuhan, *The Medium Is The Message: An Inventory of Effects,* (Berkeley: Gingko Press), 8.

[10] Jonathan Sterne, *The Audible Past: Cultural Origins of Sound Production,* (Durham, North Carolina: Duke University Press), 2.

[11] Murray R. Schafer, *The Soundscape: Our Sonic Environment and the Tuning of the World,* (Rochester, Vt: Destiny Books), 90.

[12] Pierre Schaeffer, "Acousmatics," *Audio Culture: Readings in Modern Music,* (New York: Bloomsbury, 2004), 77-79.

previously hierarchal relationship; this new phenomenology was “made palpable by radio and phonograph.”[13] “It is listening itself that becomes the origin of the phenomenon to be studied… it is the radio and the methods of reproduction, along with whole sets of electro-acoustic transformations, that place us, modern listeners to an invisible voice.”[14] Such considerations of cultural practice and technological mediation are central to numerous writings in philosophy, musicology and sound studies.[15,16,17,18,19,20,21,22,23,24,25,26,27,28]

Building on previous decades of philosophy regarding recorded sound objects, Paul D. Greene and Thomas Porcello use the term “techoustemology” to identify the influences to a person’s knowledge and understanding brought about by the technological mediation of

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[13] Christoph Cox and Daniel Warner, *Audio Culture: Readings in Modern Music,* (New York: Bloomsbury, 2004), 76.

[14] Pierre Schaeffer, “Acousmatics,” *Audio Culture: Readings in Modern Music,* 77.

[15] Walter Benjamin, *The Work of Art in the Age of Mechanical Reproduction,* ed. Hannah Arendt, trans. Harry Zohn, (New York: Schocken Books, 1969).

[16] Brian Kane, *Sound Unseen: Acousmatic Sound in Theory and Practice,* (New York: Oxford University Press, 2014).

[17] Pierre Bourdieu, *The Field of Cultural Production: essays on art and literature,* (New York: Columbia Press, 1993).

[18] Nicholas Bourriaud, *Relational Aesthetics,* trans. Simon Pleasance and Fronza Woods with the participation of Mathieu Copeland, (Dijon: Les presses du réel, 2002).

[19] David J.Levin, *Fidelity in Translation: Mozart and Da Ponte’s Le nozze di Figaro,* (Chicago: University of Chicago Press, 2007).

[20] Simon Reynolds, “Noise,” *Audio Culture: Readings in Modern Music,* (New York: Bloomsbury, 2004).

[21] Jonathan Sterne and Mitchell Akiyama, “The Recording That Never Wanted to Be Heard and Other Stories of Sonification,” *The Oxford Handbook of Sound Studies,* ed. Trevor Pinch and Karin Bijsterveld, (New York: Oxford University Press, 2012).

[22] Hans-Joachim Braun, “Turning a Deaf Ear? Industrial Noise and Noise Control in Germany since the 1920’s,” *The Oxford Handbook of Sound Studies,* ed. Trevor Pinch and Karin Bijsterveld, (New York: Oxford University Press, 2012).

[23] Rose Rosengard Subotnik, *Developing Variations: Style and Ideology in Western Music,* (Minnesota: University of Minnesota Press, 1991).

[24] Carolyn Abbate, “Sound Object Lessons,” *Journal of the American Musicological Society* 69, no. 3 (2016): https://doi.org/10.1525/jams.2016.69.3.793.

[25] Eric Drott, “Why the Next Song Matters: Streaming, Recommendation, Scarcity,” *Twentieth-Century Music* 15, no. 3 (October 2018): https://doi.org/10.1017/S1478572218000245.

[26] Georgina Born, “On Musical Mediation: Ontology, Technology and Creativity,” *Twentieth-Century Music* 2, no. 1 (March 2005): https://doi.org/10.1017/S147857220500023X.

[27] Susan Schmidt Horning, *Chasing Sound: Technology, Culture, and the Art of Studio Recording from Edison to the LP,* (Baltimore: Johns Hopkins University Press, 2013).

[28] Paul Berliner, *Thinking in Jazz: The Infinite Art of Improvisation,* (Chicago: University of Chicago Press, 1994).

sensations.[29] These influences can reveal themselves in descriptions of a particularly good sounding live music performance as having a CD sound. Audiences may also leave a particularly bad sounding live performance disappointed that it didn't live up to the aesthetic standard of a recording. Greene and Porcello further identify the potential for a listener to perceive a recording as more realistic than a live performance. Such subjective perceptions reveal privileges and biases imparted by the inherent authority of sound object. As recordings make up an increasing proportion of the music consumed in the world, understanding its technological mediation is critical.

Virgil Moorefield's book *The Producer as Composer: Shaping the Sounds of Popular Music* considers musical aesthetics and practices in relation to recording mediums. The author states: "recording has gone from being primarily a technical to an artistic matter" and "recording's metaphor has shifted from one of the 'illusion of reality' (mimetic space) to the 'reality of illusion' (a virtual world in which everything is possible)."[30] I question, however, Moorefield's binarization of "technical" versus "artistic" recordings. *The Producer as Composer* identifies changing potentialities and resulting changes to musical aesthetics and authorship, but I disagree with the implication that "technical" decisions made in early recordings weren't "artistic." Viewing technology as "neither voluntaristic nor deterministic but as caught up in a complex, fluid, variable dynamic of each"[31] we have to also acknowledge the "reality of illusion" as contributing to (not superseding) an "illusion of reality."

In *The Audible Past: Cultural origins of sound reproduction,* Jonathan Sterne addresses the reciprocal nature of sound's technological mediation as a non-binary "cultural problem."[32] Sterne recounts early experiments with the telephone and phonograph in which, as "conventional language helped the machine along … certain types of sound were privileged."

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[29] Thomas Porcello, Paul D. Green and Project Muse, *Wired For Sound: Engineering and Technologies in Sonic Cultures,* (Middletown, Conn: Wesleyan University Press, 2004), 270.

[30] Virgil Moorefield, *The Producer as Composer: Shaping the Sounds of Popular Music,* (Cambridge: The MIT Press, 2005), xiii.

[31] Timothy B. Taylor, *Strange Sounds: Music, Technology and Culture,* (New York: Routledge, 2001), 30.

[32] Jonathan Sterne, *The Audible Past: cultural origins of sound production,* 218.

These privileged sounds included rhymes, popular quotations, newspaper headlines, etc. When the telephone was introduced at the Philadelphia International Exposition in June of 1876, Alexander Graham Bell began his demonstration with “to be or not to be…”. When testing his phonograph, Thomas Edison recorded “Mary had a little lamb…”. These examples of “speech that could be easily interpreted on the basis of little actual audio information,”[33] relied on anticipatory listening and cognitive inference as much as technological fidelity. Whether or not the transmission was technically successful, the listener could easily fill in the blanks. Similar privileges and biases are identified in early recordings of music: “Performers had to develop whole new performance techniques in order to produce ‘originals’ suitable for reproduction.”[34] By shifting focus to the listener, Sterne and others address profound questions of cognition in relation to music and sound.[35,36,37,38,39]

As sound objects can influence listeners “across geography, culture and history,”[40] there are cultural cues to which, due to the separation of sound and source, a listener must attend. Marshall McLuhan states: “The new electronic interdependence recreates the world in the image of a global village,”[41] and “any understanding of social and cultural change is impossible without a knowledge of the way media work as environments.”[42] Mendi Obadike’s theory of “acousmatic blackness” identifies the power of technological mediums to transmit

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[33] Jonathan Sterne, *The Audible Past: cultural origins of sound production,* 247-250.

[34] Jonathan Sterne, *The Audible Past: cultural origins of sound production*, 26.

[35] Aniruddh D. Patel, *Music, Language, and the Brain,* (New York: Oxford University Press, 2008).

[36] Michael P. Notter et al., “Encoding of Auditory Temporal Gestalt in the Human Brain,” *Cerebral Cortex* 29, no. 2 (February 2019): 475-484. https://doi.org/10.1093/cercor/bhx328.

[37] Andreas Schindler, Marcus Herdener and Andreas Bartels, “Coding of Melodic Gestalt in Human Auditory Cortex,” *Cerebral Cortex* 23, no. 12 (December 2013): 2987-2993. https://doi.org/10.1093/cercor/bhs289.

[38] Jan Schnupp, Israel Nelken and Andrew King, *Auditory Neuroscience: Making Sense of Sound,* (Cambridge, Mass: MIT Press, 2011).

[39] Timothy Gardner, Yoonseob Lim and Barbara Shinn-Cunningham, “Auditory Contours and Gestalt Rules for Sound Analysis,” *Frontiers in Neuroinformatics* 5, (August 2011). http://dx.doi.org/10.3389/conf.fninf.2011.08.00146.

[40] Micheal Chanan, *Repeated Takes: A Short History of Recording and Its Effects on Music*, (London: Verso, 1995), 7.

[41] Marshall McLuhan, *Understanding Media: The Extensions of Man,* Critical Edition, (Berkeley: Gingko Press, 2003), 67.

[42] Marshall McLuhan, *Understanding Media: The Extensions of Man,* 26.

racial stereotypes where no race is present.[43] Following on these ideas, I assert in chapter two that a cultural appropriation was facilitated by a sound object's inherent authority.

A particular challenge to this investigation is a discussion of cause and effect. My concern is that *discussions* of causality are separate and potentially more problematic than *conclusions* of cause and effect. In identifying the problems surrounding technological discourse, Timothy Taylor states: "In debates over determinism and voluntarism, it is clearly agency that makes the difference: people are either agents in the face of technology, or they are unagentic. But this is clearly not the case." In response to this false binary, Taylor prefers to "view technology as neither voluntaristic nor deterministic but as caught up in a complex, fluid, variable dynamic of each."[44]

Building on the ambiguity of agency, Sherry B. Ortner asserts practice theory as a founding argument: "Human action is made by 'structure' and at the same time always makes and potentially unmakes it."[45] "Structure, thus, does not preclude agency, but rather structure and agency presuppose each other."[46] Brian Kane identifies "continuities or discontinuities of cultural practice in relation to changing sound media, their materiality, and their specificity."[47] Similar perspectives of agency, technological affordance, continuity and discontinuity, etc., inform my assertion that as jazz music and recording technologies changed and developed, they grew ever more intertwined. A reciprocal and symbiotic web of influence was created.

As stated, care must be taken to avoid binarizations that extrapolate to absolutes. My position is that in the absence of a particular actor, agent, or structure – especially non-human ones such as recording technology – the transmission and history of jazz would be significantly

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[43] Mendi Lewis Obadike, *Low fidelity: stereotyped blackness in the field of sound,* (PhD diss. Duke University, Durham NC, 2005), ProQuest Dissertations & Theses Global.

[44] Timothy B. Taylor, *Strange Sounds: Music, Technology and Culture,* 30-31.

[45] Sherry B. Ortner, *Making Gender: The Politics and Erotics of Culture,* (Boston: Beacon Press, 1996), 2.

[46] Timothy B. Taylor, *Strange Sounds: Music, Technology and Culture,* 35.

[47] Brian Kane, "Relays: Audiotape, Material Affordances, and Cultural Practice," *Twentieth-Century Music* 14, special issue 1 (March 2017): 66. https://doi.org/10.1017/S1478572217000068.

different, with implications for authorship, related work-concepts, and even issues of cultural assimilation.

I claim that results attributable to disparate potentialities reflect *a* causal relationship. Additional problems arise, however, when extrapolation to an absolute leads to generalization. That is, an identified *specific* cause becomes *the* general cause. Brian Eno states that: "Recording created the jazz idiom."[48] In addition to a lack of historic context, within a useful discourse of cause and effect, this is overstated, absolute, and generalized. Eno identifies a potentiality made available by recording technology: "So they were listening to things that were once only improvisations for many hundreds of times, and they were hearing these details as being compositionally significant."[49] Eno generalizes this potentiality to be *the* cause: "I think recording created the jazz idiom." Eno's identification of a potentiality has greater utility than his discussion of causality.

Adding credence to a non-binarized approach to culture and technology is Vladimir Jankélévitch's assertion that "no cause is entirely the cause, and no effect is exclusively an effect."[50] Implicit in this statement is that cause *is* effect and vice versa. This perspective mirrors McLuhan's assertion that: "The content of any medium is always another medium"[51] and "there is no principle of causality in a mere sequence. That one thing follows another accounts for nothing."[52] In some sense, the cause of a subsequent mediation is the effect of a previous one.

Jazz music is an ideal subject for an investigation of the technological mediation of sound. Its development as a musical form has coincided historically with developments in recording technology and culture.

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[48] Brian Eno, "The Studio as Compositional Tool," *Audio Culture: Readings in Modern Music,* ed. Christopher Cox and Daniel Warner, (New York: Continuum, 2006), 128.

[49] Brian Eno, "The Studio as Compositional Tool," *Audio Culture: Readings in Modern Music,* ed. Christopher Cox and Daniel Warner, 128.

[50] Vladimir Jankélévitch, *Music and the Ineffable,* trans. by Carolyn Abbate, (Princeton: Princeton University Press, 2003), 27.

[51] Marshall McLuhan, *Understanding Media: The Extensions of Man,* 10.

[52] Marshall McLuhan, *Understanding Media: The Extensions of Man,* 12.

In chapter two, I make a case for acknowledging recordings as the authoritative texts in jazz's history. In relation to Linton Chiswick's assertion that "the early years of the century were the dark days of jazz prehistory - they survive today only as a confused but fascinating mixture of fact and conjecture, in which myth and reality continue to battle it out for supremacy,"[53] I consider jazz's first recording. I conclude that a sound object possesses inherent authority. In the case of The Original Dixieland Jazz Band's recording of *Livery Stable Blues,* the sound object's inherent authority facilitated a cultural appropriation and erroneous claims of "INVENTING JAZZ."[54]

Chapter three reveals the inherent intertextuality of James Moody's composition *The Flight of The Bopple Bee* by studying its 1949 recording. Defining intertextuality as "the entire range of ways a musical work refers to or draws on other musical works… embracing everything from direct quotation to stylistic allusion and use of conventions,"[55] I conclude that Moody (and other jazz musicians) draw upon multiple sources for formal, melodic, harmonic, and rhythmic material to create intertextual works.

Chapter four focuses on the technological mediation of intertextuality between James Moody's recording of *I'm In the Mood For Love* and Eddie Jefferson's composition *Moody's Mood for Love.* By examining both works, compositional characteristics of *Moody's Mood For Love* are shown to draw from James Moody's improvised recording. I conclude that Eddie Jefferson's allusion to a recording of an ephemeral improvisation is afforded by technological meditation.

In chapter five, I examine the practical use of recordings as text by considering Chick Corea's 1997 recording of Bud Powell's composition *Bouncin' With Bud.* In the liner notes, Corea acknowledges that he "gathered up all the recordings [he] could" and "gathered as

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[53] Linton Chiswick, *Milestones of Jazz: A chronological history of jazz music in photography,* (Surrey, England: CLB International, 1997), 14.

[54] Jeffrey C. Ward, *Jazz: A History of America's Music,* 56.

[55] *Grove Music Online*, s.v. "Intertextuality," accessed Jun 21, 2021, https://doi.org/10.1093/gmo/9781561592630.article.52853.

many transcriptions of Bud's tunes as [he] could find."[56] I consider these words an acknowledgement that sound objects are fundamental sources for Corea's research. I reveal the technological transmission of musical characteristics by comparing Corea's recording with Bud Powell's original 1949 recording. I conclude that Corea treats Powell's recording as a theme for variation. Not only is compositional intent transmitted, but also theoretical and aesthetic approaches to improvisation.

In chapter six, I develop an analytical framework for discussing recordings. By first questioning musical notation as an adequate tool for considering non-literate music, I explore analytical tools for researching sound itself. I divide attributes of sound recordings into four categories: recorded length, dynamic range, frequency range, and spacial image. Each of these attributes can be analyzed and connected to musical characteristics. This chapter introduces audio-meters, graphs, and image-maps as a means to analyze a recording's sound characteristics. I conclude that this analysis reveals privileges and biases afforded by disparate potentialities of technological mediations.

Chapter seven applies the analytical tools developed in chapter six to a second comparison of Bud Powell's 1949 recording of *Bouncin' With Bud* with Chick Corea's 1997 recording. By considering the technical attributes of Powell's 78 RPM record and Corea's recording for CD and LP, the disparate potentialities are noted and connected to musical characteristics. I conclude that some of the musical characteristics privileged by the 1949 recording are relayed as a cultural practice. In contrast, I conclude that other musical characteristics heard in the 1997 recording are unique and were afforded by the medium's advanced technological attributes.

The conclusion reviews some of my key points and expands the discussion to consider their implications more broadly. Following Gary Tomlinson, who questions "the findings of twentieth-century, Eurocentric musicology as comprehensive,"[57] I propose recordings as

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[56] Chick Corea, *Remembering Bud Powell,* (liner notes), Stretch Records SCD-9012-2, 1997, CD.

[57] Gary Tomlinson, "Monumental Musicology," *Journal of the Royal Musical Association* 132, no. 2 (2007): 350.

important texts for musicologists. This assertion is motivated by my desire to include not only non-literate music forms but non-western theories of knowledge.

Chapter 2 - Audio recordings as jazz texts

Existing histories acknowledge jazz's technological mediation by passively identifying recordings as historic texts. As this acknowledgement is most often implicit, it strangely becomes evident in instances where recordings are absent. For example, in the chapter *1902-1928: New Orleans to New York* from the book *Milestones of Jazz: A chronological history of jazz music in photography,* the author states: "the early years of the century were the dark days of jazz prehistory - they survive today only as a confused but fascinating mixture of fact and conjecture, in which myth and reality continue to battle it out for supremacy."[58] Despite this books pictorial format, I don't believe the author is identifying a lack of photographic evidence. This "prehistory" refers to a lack of audio recordings and therefore a lack of historic texts.

The Original Dixieland Jazz Band's recording of *Livery Stable Blues* is commonly considered to be the first recording of jazz.[59] Released in March of 1917, the power of this first recorded jazz object facilitated an erroneous claim that members of the Original Dixieland Jazz Band were: "THE CREATORS OF JAZZ."[60] As evidence that: "Societies have always been shaped more by the nature of the media by which [people] communicate than by the content of the communication,"[61] the creation and reception of this recording transcended (or subverted) geography, culture, and history. In order for the Original Dixieland Jazz Band's claim of "creating jazz" to be made (let alone accepted), the recorded object needed to exert greater authority and reach than all previously unrecorded jazz performances.

In contrast to the previous claim, jazz was not created by any one person or group. Jazz is a product of the confluence of European, West-African, and other traditions in New Orleans. The "fascinating mixture of fact and conjecture," however, includes Jelly Roll Morton's declaration that: "It is evidently known, beyond contradiction, that New Orleans is the cradle of

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[58] Linton Chiswick, *Milestones of Jazz: A chronological history of jazz music in photography,* 14.

[59] Linton Chiswick, *Milestones of Jazz: A chronological history of jazz music in photography,* 26.

[60] Jeffrey C. Ward, *Jazz: A History of America's Music,* 56.

[61] Marshall McLuhan, *The Medium Is The Message: An Inventory of Effects,* 8.

jazz, and I, myself happened to be [its] creator in the year 1902."[62] Some realities do exist in Morton's conjecture. New Orleans is considered to be the "cradle" of jazz and Morton's Creole ancestry is significant. *Livery Stable Blues,* however, was recorded in New York in 1917 by an entirely white band. Despite these incongruities, by recording *Livery Stable Blues,* a jazz text was created. Its reach and influence was not limited to listeners in spacial, cultural, nor temporal proximity. This sound object could be replayed and studied.

In the case of *Livery Stable Blues,* a troublesome appropriation was facilitated by "the nature of the media." This appropriation reveals itself in assertions made by Original Dixieland Jazz Band's cornetist Dominick James "Nick" LaRocca. In a 1936 interview in *Tempo* magazine LaRocca states: "Our music is strictly white man's music" adding that "the negroes learned to play this rhythm and music from the whites" and "the negro did not play any kind of music equal to white men at any time."[63] Interestingly, Freddie Keppard, the New Orleans cornetist, is thought to have declined an earlier opportunity to record for fear that "other musicians would steal his stuff."[64] Keppard's fear now seems prescient. With regards to the Original Dixieland Jazz Band, I argue that without the opportunity to record, they would have been forgotten by history long ago. They were temporal, cultural, and geographic outliers. *Livery Stable Blues* exists only in relation to a historic jazz text. This sound object possesses an inherent authority that exceeds the authority of its content. The relocation of cultural authority facilitated LaRocca's appropriation.

In the face of contradictory statements as to the origins of jazz, it becomes easy to both understand *and* refute Brian Eno's assertion that: "Recording created the jazz idiom." Eno clarifies his thought: "Jazz was from 1925 onwards, a recorded medium, and from '35 onwards I guess—I'm not a jazz expert by any means—it was a medium that most people received via records." Eno goes on to paraphrase Marshall McLuhan's position that "It [the medium] makes

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[62] Geoffrey C. Ward, *Jazz: A History of America's Music*, 25.

[63] Dominick LaRocca, "History of The Original Dixieland Jazz Band," *Tempo,* October, 1936, pp. 4, 11-12.

[64] Paul Berliner, *Thinking in Jazz: The Infinite Art of Improvisation,* 785.

all music all present. So not only is the whole history of our music with us now, in some sense, on record, but the whole global musical culture is also available."[65] *Livery Stable Blues* exploits the availabilities identified by Eno and McLuhan both in its creation and reception. To accept Eno's initial assertion that "recording created the jazz idiom," one would seemingly have to accept The Original Dixieland Jazz Band's assertion that they were "THE CREATORS OF JAZZ."[66]

Recording did not create the jazz idiom. Prior to its first recording in 1917, jazz had existed in an ephemeral state of prehistory. What recording *did* create was our current knowledge and understanding of the music. That our knowledge of jazz music relies on recordings as authoritative texts is so fundamental, it has become implicit. By studying the nature of recording mediums, including their privileges and biases, I will detail an explicit connection between jazz music and technology. I claim that as jazz music and recording technologies developed, they grew ever more intertwined. A reciprocal and symbiotic web of influence was created.

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[65] Brian Eno, "The Studio as Compositional Tool," *Audio Culture: Readings in Modern Music,* 128.

[66] Jeffrey C. Ward, *Jazz: A History of America's Music,* 56.

Chapter 3 - Intertextuality: *The Flight of the Bopple Bee*

Saxophonist James Moody moved from the United States to Europe in 1948. Moody later acknowledged it was feeling "scarred by racism"[67] that precipitated his departure. While in Sweden in 1949, James Moody and His Band made a recording later released on Prestige. Moody's composition *The Flight of the Bopple Bee* was on side A of the 78 RPM, and on side B was his rendition of the popular song *I'm In The Mood For Love.*[68] *The Flight of the Bopple Bee* exemplifies jazz's inherent intertextuality. That is, it refers to other musical works and embraces direct quotation and stylistic allusion. Moody's improvisation over *I'm in the Mood for Love* formed the basis for the subsequent composition *Moody's Mood for Love b*y Eddie Jefferson. By examining composed and improvised musical characteristics of *The Flight of the Bopple Bee,* I conclude that it connects to other works through multiple means. In chapter four, I examine improvised characteristics of Moody's solo on *I'm in The Mood For Love* and composed characteristics of *Moody's Mood for Love.* I conclude that these works are connected by technological mediation.

3.1 *The Flight of the Bopple Bee*: form.

In figure 3.1, I've transcribed a lead-sheet to *The Flight of the Bopple Bee.* It includes the intro, head, and solo section.

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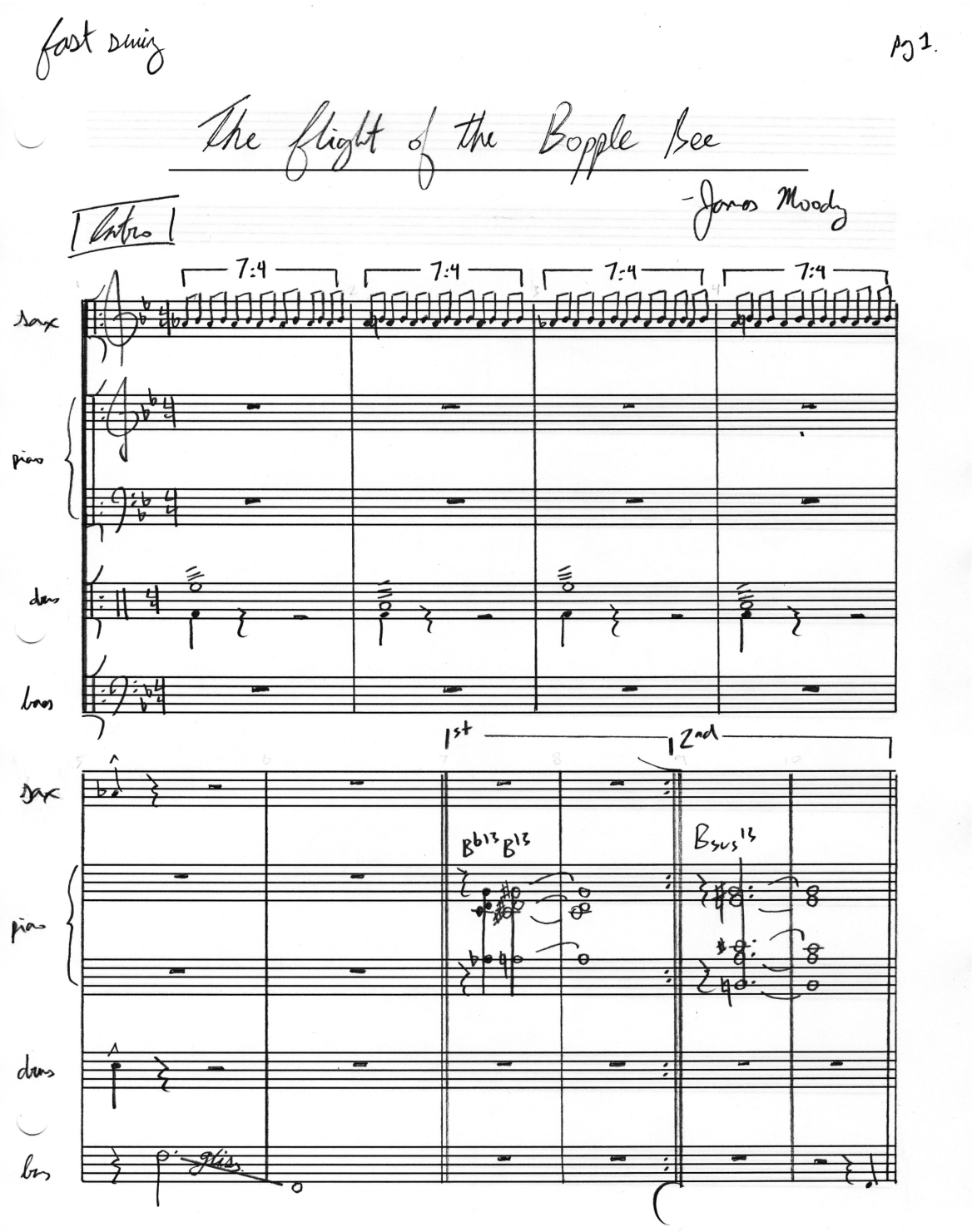
[67] "Moody's Mood For Bop," interview by Patrick Ambrose, *The Morning News,* February 14, 2007, https://themorningnews.org/article/moodys-mood-for-bop.

[68] James Moody and His Quartet, *The Flight* / *I'm In The Mood For Love,* Prestige 703, 1950, 78 RPM record.


fast swing
pg 1.
The flight of the Bopple Bee
-James Moody
Intro
7:4
7:4
7:4
7:4
sax
piano
drums
bass
1st
2nd
sax
piano
drums
bass
Bb13 B13
Bsus13

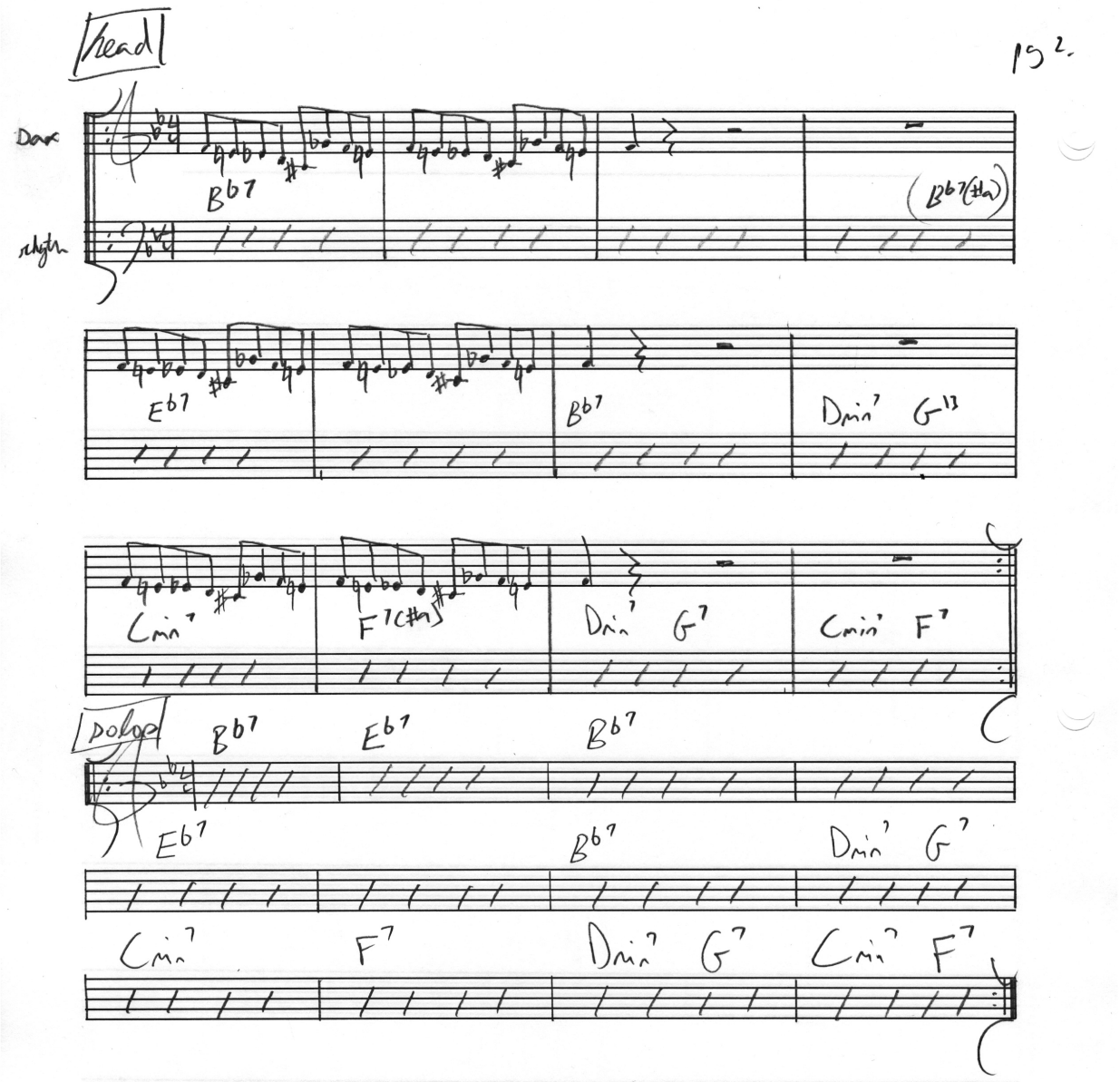


Figure 3.1. A transcription of James Moody's composition "The Flight of the Bopple Bee" (intro, head, and solo section).

By examining the head and solo sections of *The Flight of the Bopple Bee* in figure 3.1, it can be seen that this tune is written over a blues form. That is, the main melodic component occurs and repeats over a twelve bar form. Subsequent twelve bar forms, repeated with similar harmonic progressions, provide the basis for improvisation.

Blues forms stand as monuments to the confluence of musical traditions that occurred in New Orleans. Enslaved and racialized people were often forbidden from playing their traditional instruments and instead approximated their music forms on western (and often pitched) instruments. In defiance of strict tonality characterized as "an assault on pitch,"[69] this and other blues compositions straddle the division between minor and major. This is immediately evident by the presence of a dominant I chord. This chord includes a major third and a minor seventh (most often extended to Bb13 or Bb7(#9) on this recording). Additionally, improvisations over a blues are as likely (if not more likely) to draw from a parallel minor tonality than the major tonality indicated by the key signature. A succinct definition of blues is minor melody over major harmony. Therefore, despite the prevalence of D naturals in Bb13 chords, a good approach to improvising over a blues in Bb, as evident by the approach often taken by James Moody, is to privilege Db over D natural.

Harmonic progressions heard as blues forms vary extensively within jazz music and music more broadly. There are notable harmonic characteristics that distinguish this tune from a blues in its simplest iteration. These include the IV7 chord in bar 2 and the changing harmonic function as the Bb7 (I7) becomes V7 of IV7 in bar 4. This type of back-cycling (the superimposition of harmonic progressions leading to a point of resolution) is often heard to include an Fmin7 chord in bar 3. Back-cycling is a useful framework for understanding many of the harmonic characteristics of this tune. A simpler iteration of a blues form would also include an Eb7 (IV7) in bar 9 and a Bb7 (I7) chord in bar 11. In bars 8 through 10 and 11 through 12, of *The Flight of the Bopple* Bee, are heard Dmin7-G7-Cmin7-F7 in varying harmonic rhythms. These cycling progressions (D-G-C-F) serve to delay resolution and create harmonic momentum leading to the top of the form.

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[69] Barry Ulanov*, A History of Jazz in America*, 29.

3.2 *The Flight of the Bopple Bee*: intertextuality.

To demonstrate the overt intertextuality inherent in *The Flight of the Bopple Bee*, figure 3.2 compares its melody with an excerpt from Nicholai Rimsky-Korsakov's Opera: *The Tale of Tsar Saltan.* This excerpt is from Rachmaninov's piano arrangement of the orchestral interlude commonly referred to as *The Flight of the Bumblebee.*

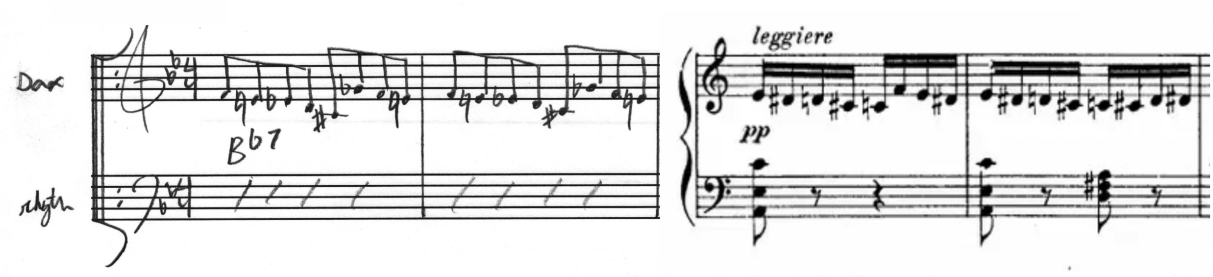

Figure 3.2. Bars one and two of the head to "The Flight of the Bopple Bee" compared with bars nine and ten of Rachmaninov's piano arrangement of "The Flight of the Bumblebee."

As can be seen in figure 3.2, the recurring melody in *The Flight of the Bopple Bee* is a literal transposition and repetition of a one bar fragment that recurs in Rimsky-Korsakov's orchestral interlude. Note the super-imposition of minor melody over major harmony previously discussed. Although this melody is largely chromatic, it is seen in the Rachmaninov excerpt to be in A minor. The transposition heard in Moody's composition is up one semi-tone to Bb minor. *The Flight of the Bopple Bee* is in Bb, and despite the ambiguity of blues tonality previously discussed, it is common practice in jazz music to use a major key signature (unless the blues is specifically minor… which is a different thing again).

As I continue listening through the recording, I hear many concise melodic fragments in Moody's improvisation. One notable intertextual quote occurs about two minutes into the less than three minute recording. Figure 3.3 is a four bar fragment of James Moody's solo beginning at the start of an improvised form. Figure 3.4 is a transcription of the first four bars of Thelonious Monk's composition *Rhythm-a-ning.* This excerpt is taken from the 1957 recording

by Art Blakey's Jazz Messengers. This is the first known recording of *Rhythm-a-ning*.[70] The commonality of this melodic fragment is clearly seen and heard.

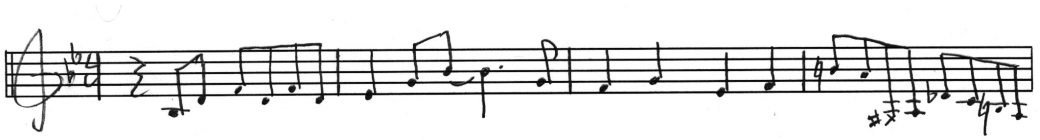

Figure 3.3. Four bars from James Moody's improvised solo (The first bar corresponds with the start of a form).

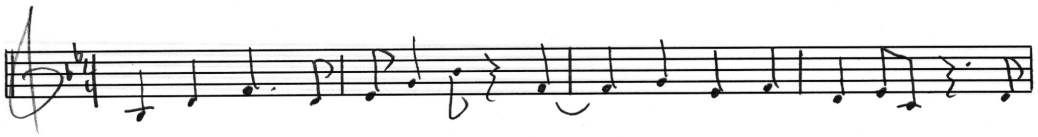

Figure 3.4. Four bars from Art Blakey's Jazz Messengers's recording of "Rhythm-a-ning."

Further down the intertextual rabbit-hole, is that *Rhythm-a-ning* is based on the form and harmonic progression of the 1930 composition *I Got Rhythm* by George and Ira Gershwin. This form subsequently became known as rhythm changes. Additionally, as the first recording of *Rhythm-a-ning* took place on May 15, 1957, the presence of this melodic fragment in Moody's 1949 recording indicates a complex and reciprocal network of influence with multiple mechanisms of mediation. The following figures are transcriptions that outline recorded evidence of this melodic fragment's existence within the jazz vocabulary as early as 1936.

Figure 3.5. A four bar excerpt from Mary Lou Williams's composition: "Walkin' and Swingin'" recorded in 1936 by Andy Kirk and Mary Lou Williams. [71]

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[70] Thelonious Monk, *Art Blakey's Jazz Messengers with Thelonious Monk,* Atlantic 1278, 1958, LP.

[71] Mary Lou Williams, *Andy Kirk & His Twelve Clouds Of Joy,* Decca 809, 1936, 78 RPM record.

Figure 3.6. A four bar excerpt from Charlie Christian's composition "Up on Teddy's Hill" recorded in 1941.[72]

Figure 3.7. A four bar excerpt from Sonny Stitt's composition: "Symphony Hall Swing" recorded in 1952.[73]

Jazz is a complex intertextual music form. Composing and improvising jazz musicians draw upon multiple sources for formal, melodic, harmonic, and rhythmic material. The mechanisms for this influence are numerous. It is possible that the incorporation of a melodic fragment from *The Flight of The Bumble Bee* into Moody's composition indicates a literate mode of transmission. But the short melodic fragment contained in Moody's improvisation identified as either *Walkin' and Swingin'*, *Up on Teddy's Hill, Symphony Hall Swing*, or *Rhythm-a-ning,* is likely attributable to an aural mode of transmission. It is uncertain, however, whether this aural transmission was mediated by technology. It is likely that Moody and others would have heard this fragment both on recordings and in person. My ability to examine this fragment, however, is clearly mediated by technology. The subjects of my previous analyses are sound objects. My ability to transcribe *The Flight Of the Boppple Bee* and various fragments from improvised and ephemeral performances is fundamentally dependent on recordings as text.

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[72] Charlie Christian, *Charlie Christian / Dizzy Gillespie - After Hours,* recorded at Minton's Playhouse, New York City, 1941, Esoteric ES-548, 1957. LP.

[73] Sonny Stitt, *Why Do I Love You / Symphony Hall Swing,* recorded November 20 1952, Royal Roost 560 (1140), 78 RPM record.

Chapter 4 - Technological mediation of intertextuality: *Moody's Mood For Love*

Tin Pan Alley songs such as *I'm In The Mood For Love* are an integral part of jazz repertoire. During the early part of the twentieth-century, the primary source of revenue for music publishers began to shift from the sale of sheet music to recording and broadcast royalties.[74] Correspondingly, compositions such as *I'm in The Mood For Love* by Jimmy McHugh and Dorothy Fields have been recorded by countless jazz and popular musicians. What is particularly notable about James Moody's 1949 recording is that despite all its complexity, his improvised solo would serve as the foundation for a subsequent composition of popular acclaim.

Shortly after Moody's recording was released, Eddie Jefferson composed lyrics to the improvised solo and began singing it in clubs around New York. The first recording of the song by King Pleasure featured Blossom Dearie and was released on Prestige in 1952.[75] The title given to the piece on that recording, and giving a direct nod to its intertextual inspiration, was *Moody's Mood For Love.* Pleasure's recording was listed on Billboard's singles charts for four months and reached number two on their R&B rankings. Subsequent recordings by Aretha Franklin,[76] George Benson,[77] Quincy Jones,[78] Tito Puentes,[79] James Moody with Eddie Jefferson (Moody had to learn his own solo), [80] and others, firmly place this composition within the vocal and instrumental jazz repertoire. *Moody's Mood For Love* also reached a broad

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[74] Philip Furia and Laurie J. Patterson, *The American Song Book: The Tin Pan Alley Era,* (New York: Oxford University Press, 2015), 6.

[75] King Pleasure, *Moody's Mood For Love* / *Exclamation Blues*, Prestige 924, 1952, 78 RPM record.

[76] Aretha Franklin, *Hey Now Hey (The Other Side of the Sky)*, Atlantic 7265, 1973, LP.

[77] George Benson, *Give Me The Night,* Warner Bros HS3453, 1980, LP.

[78] Quincy Jones, *Q's Juke Joint,* Qwest Records 9362-45875-2, 1995, CD.

[79] Tito Puente, *Tito Puente's Golden Latin Jazz All Stars In Session*, RMM records RMM 81208, 1999, CD.

[80] James Moody and Eddie Jefferson, *Moody's Mood For Love,* Argo LP 613, 1957, LP.

audience when performed by Nancy Wilson, Bill Cosby, and Phylicia Rashad on a 1989 episode of *The Cosby Show*.[81]

Much like *The Flight of The Bopple Bee, Moody's Mood For Love* exemplifies jazz's intertextual nature and aural transmission. In contrast to *The Flight of The Bopple Bee,* however, this aural transmission could only be achieved by technological mediation. The notion that a simple motif (such as the one analyzed in the previous chapter) could disseminate via multiple means cannot apply to a performance as long and complex as Moody's improvised solo. Eddie Jefferson would have undoubtedly listened to Moody's solo repeatedly. Below, I argue that repeated listening to a recorded ephemeral performance is an indication of technological mediation. The sound object influenced a listener "across geography, culture and history."[82] Jefferson could memorize the recorded solo and compose lyrics. While I presume as to Jefferson's method, defining vocalese as "the practice of jazz singing in which texts (newly invented) are set to recorded jazz improvisations,"[83] supports my fundamental assertion.

In considering *Moody's Mood For Love* more closely*,* its musical characteristics indicate potentialities made available by the technological mediation of its intertextuality. Instances, where Moody's virtuosity is translated into lyrical song, reveal these previously unavailable potentialities. The addition of lyrics to an overall double-time and occasionally quadruple-time solo, have created a tune of unimaginable complexity.

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[81] *The Cosby Show,* season 6, episode 10, "Grampy and NuNu Visit the Huxtables," directed by Tony Singletary, featuring Bill Cosby, Phylicia Rashad, and Nancy Wilson, aired November 30, 1989, on NBC.

[82] Micheal Chanan, *Repeated Takes: A Short History of Recording and Its Effects on Music*, 7.

[83] *Grove Music Online,* s.v. "Vocalese," accessed May 12, 2021, https://doi.org/10.1093/gmo/9781561592630.article.50592.

Figure 4.1 is a transcription of the first 16 bars of James Moody's solo over *I'm In The Mood For Love.*

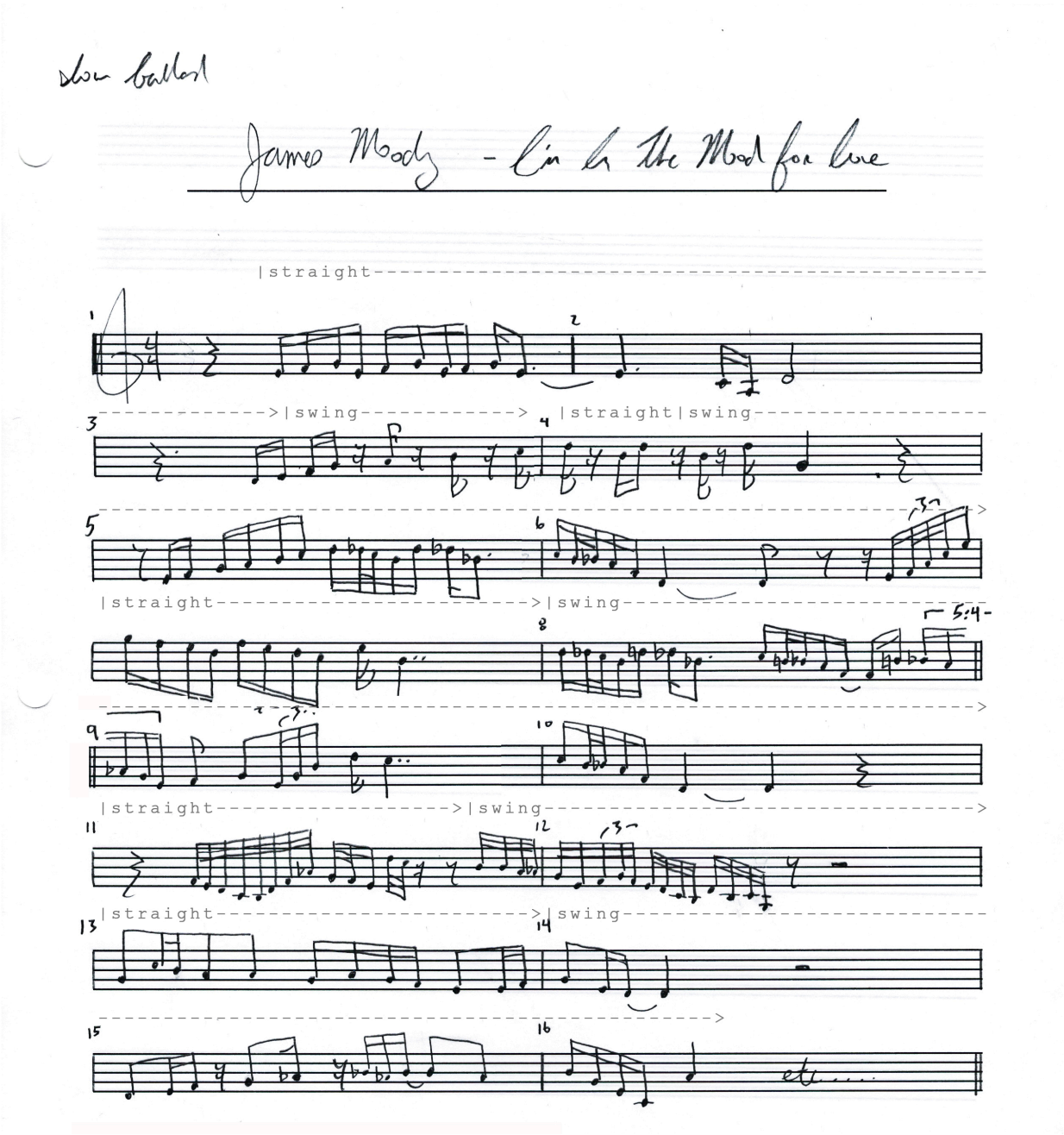

Figure 4.1. The first sixteen bars of James Moody's solo over "I'm In The Mood For Love."[84]

[84] James Moody and His Quartet, *The Flight / I'm In The Mood For Love,* Prestige 703, 1949, 78 RPM record.

In listening to this recording and looking at the transcription, Moody's virtuosity is evident. He employs a strategy of superimposing changing rhythmic frameworks. Many of the notes indicated as sixteenth-notes or sixteenth-note triplets are better understood as eighth-notes and eighth-note triplets of a double-time tempo. Further evidence of Moody's rhythmic virtuosity is that he varies the subdivision of these superimposed tempos. Many of the sixteenth notes alternate straight and swing subdivisions. This complex rhythmic approach also applies to the notated thirty-second notes and thirty-second note triplets. These are similarly understood as straight or swing eighth-notes and eighth-note triplets from a quadruple-time superimposition.

Of further interest in Moody's solo (and Jefferson's subsequent composition) are numerous syncopations. Moody also privileges harmonic motion between chords. His voice-leading provides a melodic frame that is ornamented with arpeggiations and chromatic passing notes. There are additionally, numerous intertextual references that seem of much greater importance than the song's original melody. Figure 4.2 is an excerpt from the published sheet music for *I'm In The Mood For Love.* As Moody only vaguely references the melody to the song, the lack of authority possessed by the sheet music is startling.

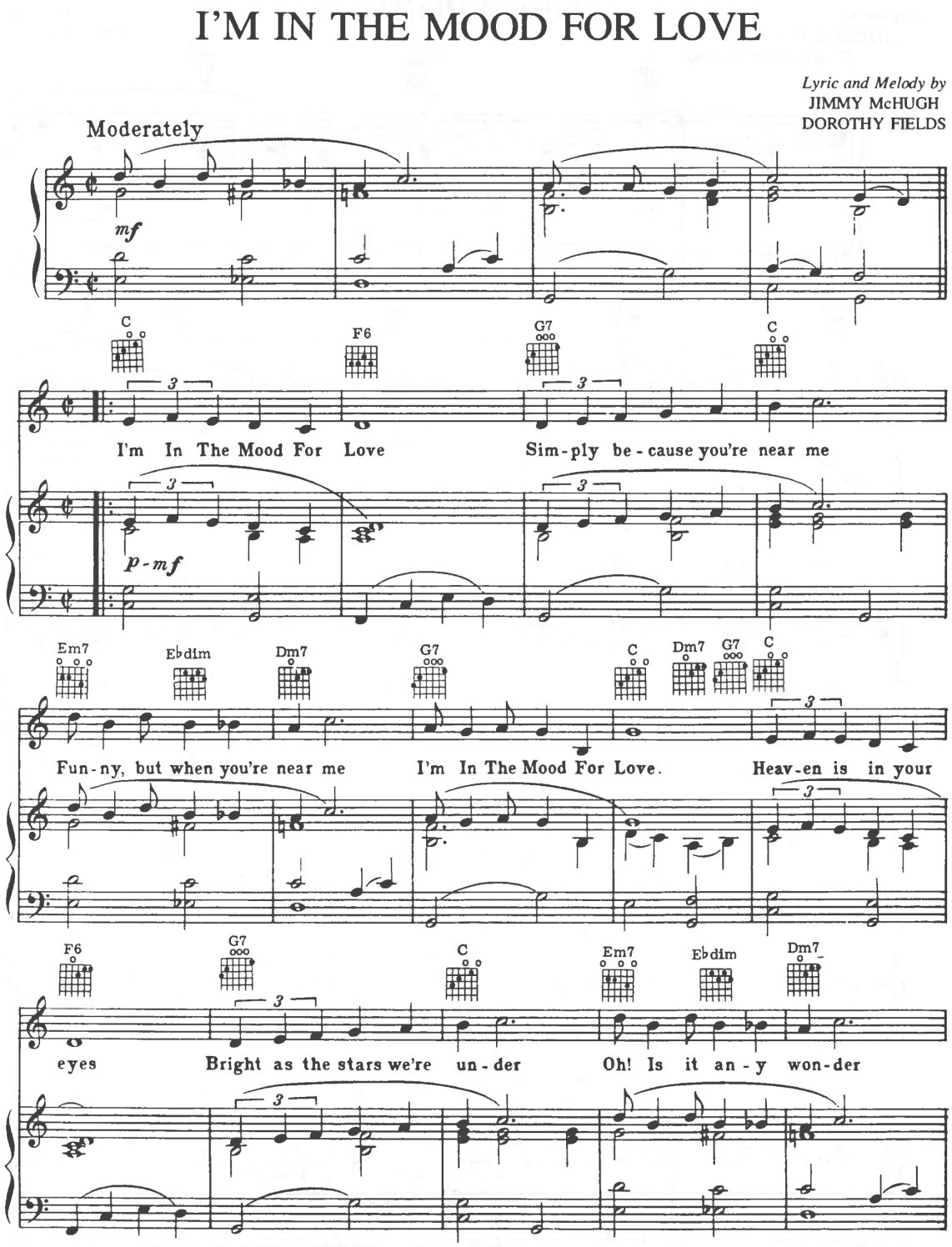

Figure 4.2. Sheet music for "I'm In The Mood For Love."[85]

[85] Jimmy McHuch and Dorothy Fields, *I'm In The Mood For Love*, Robbins Music Corporation, 1935.

In figure 4.3, I've transcribed the first sixteen bars of King Pleasure's recording of *Moody's Mood For Love*. Although the lyrics occasionally reference those of *I'm In The Mood For Love*, this tune is clearly derived from Moody's improvisation.

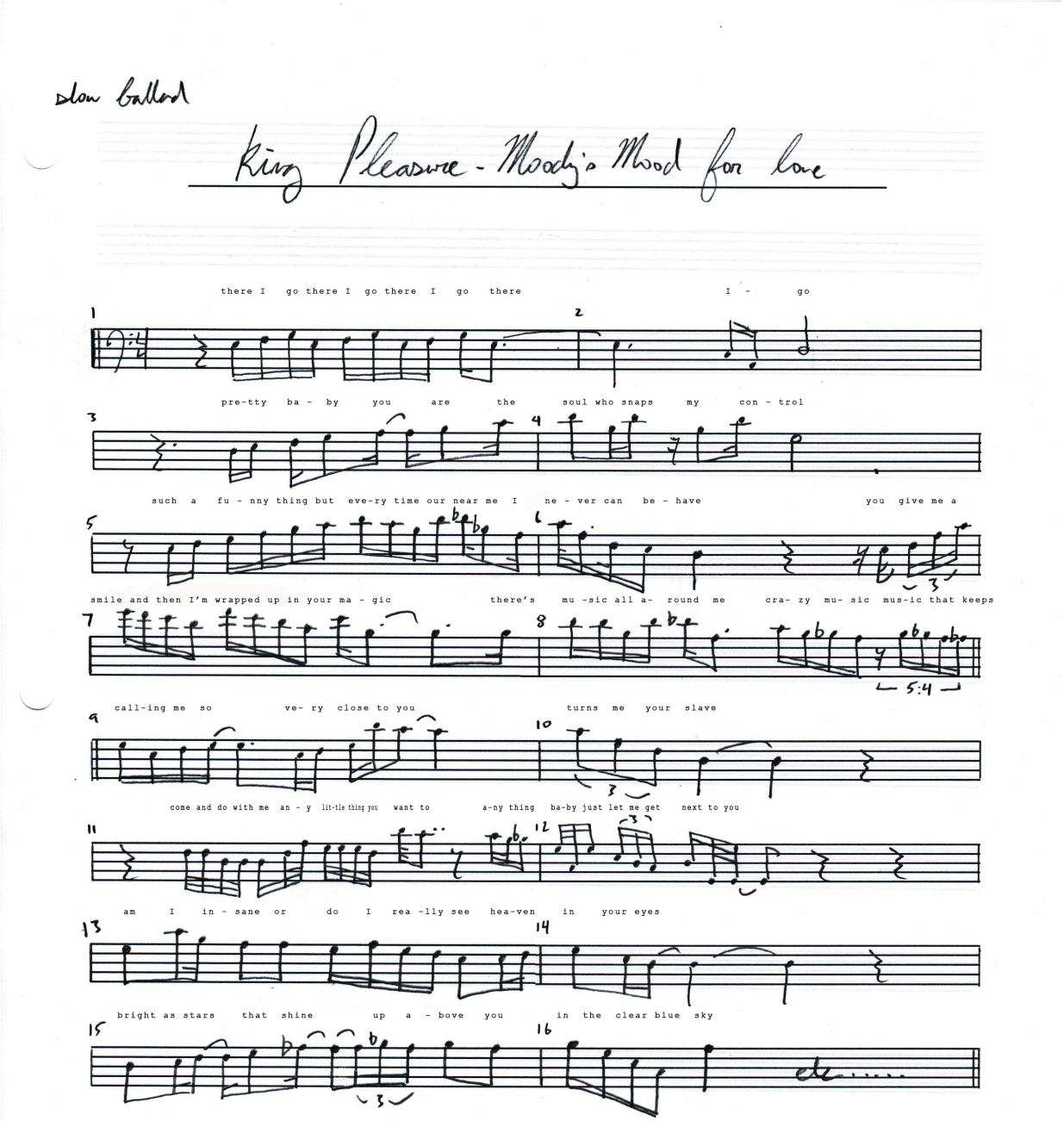

Figure 4.3. The first sixteen bars of King Pleasure's recording of "Moody's Mood For Love."[86]

[86] King Pleasure, *Moody's Mood For Love* / *Exclamation Blues*, Prestige 924, 1952, 78 RPM record.

Much of the rhythmic and melodic complexity heard in Moody's solo re-emerges in Jefferson's composition. Figure 4.4 compares bars five and six of each work.

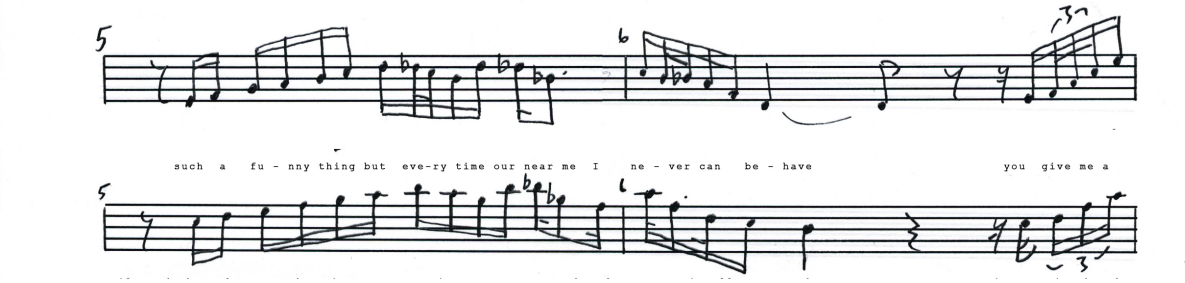

Figure 4.4. A comparison of bars five and six of James Moody's solo over "I'm In The Mood For Love" with bars five and six of King Pleasure's recording of "Moody's Mood For Love."

In bar five, Pleasure's performance omits one of the thirty-second note passing tones on beat one and includes some slight changes of pitch. There is also one note omitted from the arpeggio that leads into bar seven. Pleasure's performance is also in a different register (transcribed here in bass clef). Besides these differences, both phrases are identical. Each is rhythmically based on a double-time swing feel. Chromatic voice-leading is seen as the D (the seventh of an Emin7 chord) on beat three of bar five resolves to a Db (the seventh of an Ebmin7 chord) on beat four and then to a C (the seventh of a Dmin7 chord) on beat one of bar six. The syncopation in Moody's solo on beat four is also reflected in Jefferson's composition.

In bar six, Pleasure's performance omits one thirty-second note passing tone on beat one and includes some slight changes of pitch. There is also one note omitted from the arpeggio that leads into bar seven. Overall, however, these bars are very similar.

Jefferson also alludes to the lyrics of *I'm In The Mood For Love*. In bar five and the first half of bar six, Jefferson's lyrics are: "Such a funny thing but every time you're near me I never can behave." The lyrics in bars five through eight of the A section to *I'm In The Mood For Love* are "funny but when you're near me I'm in the mood for love."

Figure 4.5 compares bars eleven and twelve of each work.

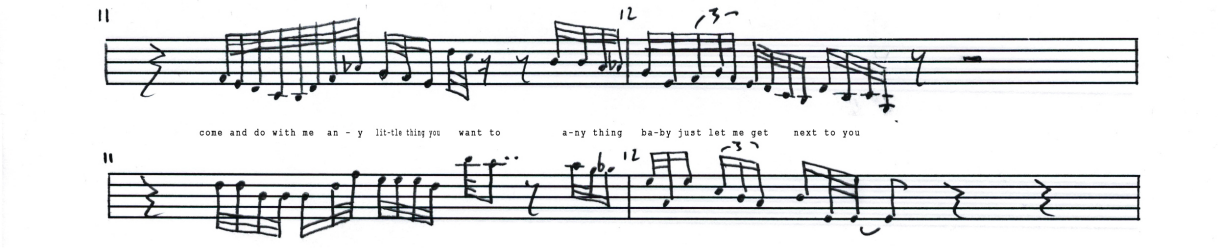

Figure 4.5. A comparison of bars eleven and twelve of James Moody's solo over "I'm In The Mood For Love" with bars eleven and twelve of King Pleasure's recording of "Moody's Mood For Love."

In this transcription, Jefferson's composition is seen to be less literal in its allusion to Moody's solo. Differences between them are likely attributable to the near impossibility of singing (or even hearing) Moody's fast phrases. (Slowing down the recording was required to transcribe this portion with any degree of accuracy). These bars are similar, however, in overall contour and phrase length. They are also derived from the same rhythmic framework - a superimposition of quadruple-time swing eighth-notes.

Figure 4.6 outlines an intertextual reference heard in bars thirteen and fourteen of each work.

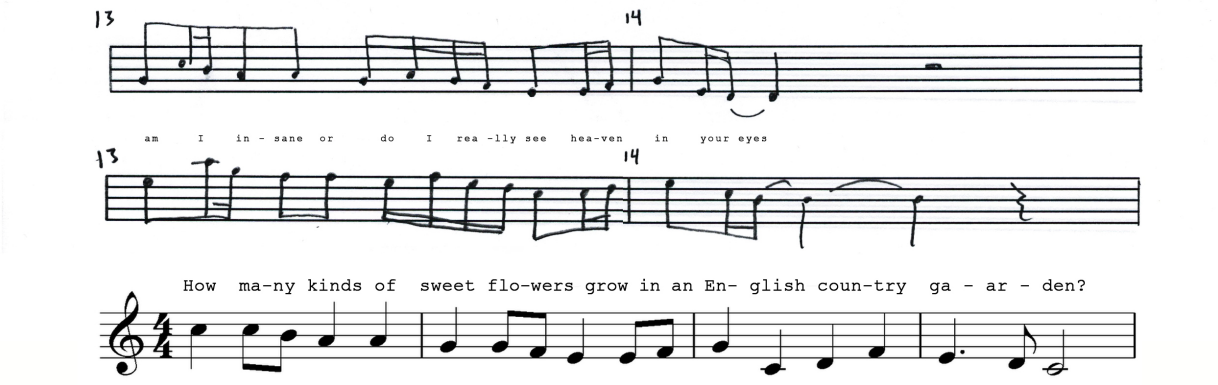

Figure 4.6. A comparison of bars thirteen and fourteen of James Moody's solo over "I'm In The Mood For Love" and King Pleasure's recording of "Moody's Mood For Love" with the English folk song "Country Garden."

In Figure 4.6, a quote from Moody's improvised solo has been transmitted into Jefferson's composition. Except for the difference of register and the duration of the last note, this phrase is identical in the two recordings. Within a double-time swing framework, Moody clearly quotes an English folk song. The subsequent addition of lyrics by Eddie Jefferson results in King Pleasure singing: "Am I insane or do I really see heaven in your eyes" to the melody of *Country Garden.* In considering other intertextual aspects of this phrase, Jefferson's lyrics are seen to allude to "heaven is in your eyes," from *I'm In The Mood For Love* (although in a different part of the form).

As is evident by the previous analyses, *Moody's Mood For Love* is a unique and complex intertextual composition. Jefferson's clear and often literal allusion to Moody's recording of *I'm In The Mood For Love* points to aural transmission. I argue that the use of Moody's recording as a source constitutes technological mediation of aural transmission. The potentialities made available by recording an ephemeral work have contributed to subsequent music. Without the objectification of Moody's improvisation by recording technology, *Moody's Mood For Love* wouldn't exist.

Chapter 5 - Jazz text in practice: *Bouncin' With Bud*

In 1997, the American jazz pianist and composer Chick Corea released an album featuring compositions by Bud Powell entitled *Remembering Bud Powell*. My analysis will focus on the composition *Bouncin' With Bud.* In considering this recording, two broad perspectives for analysis present themselves. First, close examinations of the liner notes and the music reveal the extent to which Corea relied on recordings as text. Second (and addressed in chapter 7), a comparison of Corea's recording with the original 1949 recording reveals disparate potentialities presented by their respective technological mediations. These potentialities will be connected to musical characteristics.

In Tony Cohen's liner notes to *Remembering Bud Powell,* Chick Corea is quoted as saying: "From the crib on, I grew up with Bud's music and absorbed his personal approach. I learned an incredible amount about music and improvising at the piano through him. I think more than any other pianist, Bud has remained a constant inspiration to me. His compositions and recorded work are a true legacy in jazz and 20th century American Music." Corea adds that in researching Bud Powell's music for this album: "I gathered up all the recordings I could" and "gathered as many transcriptions of Bud's tunes as I could find."[87] I argue that all of these statements either implicitly or explicitly acknowledge recordings as the means (or medium) through which Chick Corea knows Bud Powell and his music.

It is unlikely that Chick Corea's "crib" was in a club where Bud Powell was performing. Corea's "growing up" with Powell's music was technologically mediated. Despite the familiarity with which Corea refers to "Bud," this "constant inspiration" was mediated by recording. In identifying "recordings" and "transcriptions" as the main sources of research, Corea acknowledges that much of jazz's aural transmission occurs via recorded sound objects.

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[87] Chick Corea, *Remembering Bud Powell,* (liner notes), Stretch Records SCD-9012-2, 1997, CD.

Recordings of Bud Powell's have influenced Chick Corea (and numerous other musicians) "across geography, culture and history."[88]

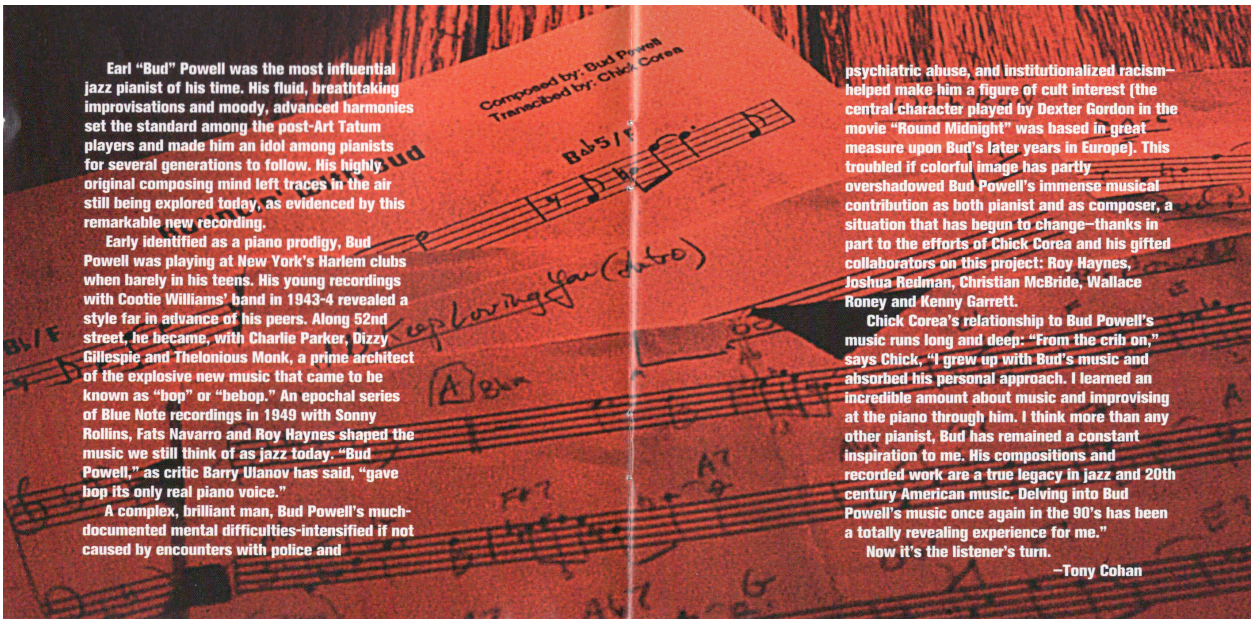

Figure 5.1. Liner notes from Chick Corea's album: "Remembering Bud Powell." In the background photo a 'lead-sheet' for "Bouncin' With Bud" states: "Composed by: Bud Powell, Transcribed by: Chick Corea."

By comparing Chick Corea's recording with Bud Powell's, the transmission becomes evident. The objectification of Powell's music by recording facilitated its propagation into Corea's performance. Figure 5.2 is a lead-sheet transcribed from the original Bud Powell 1949 recording session.[89]

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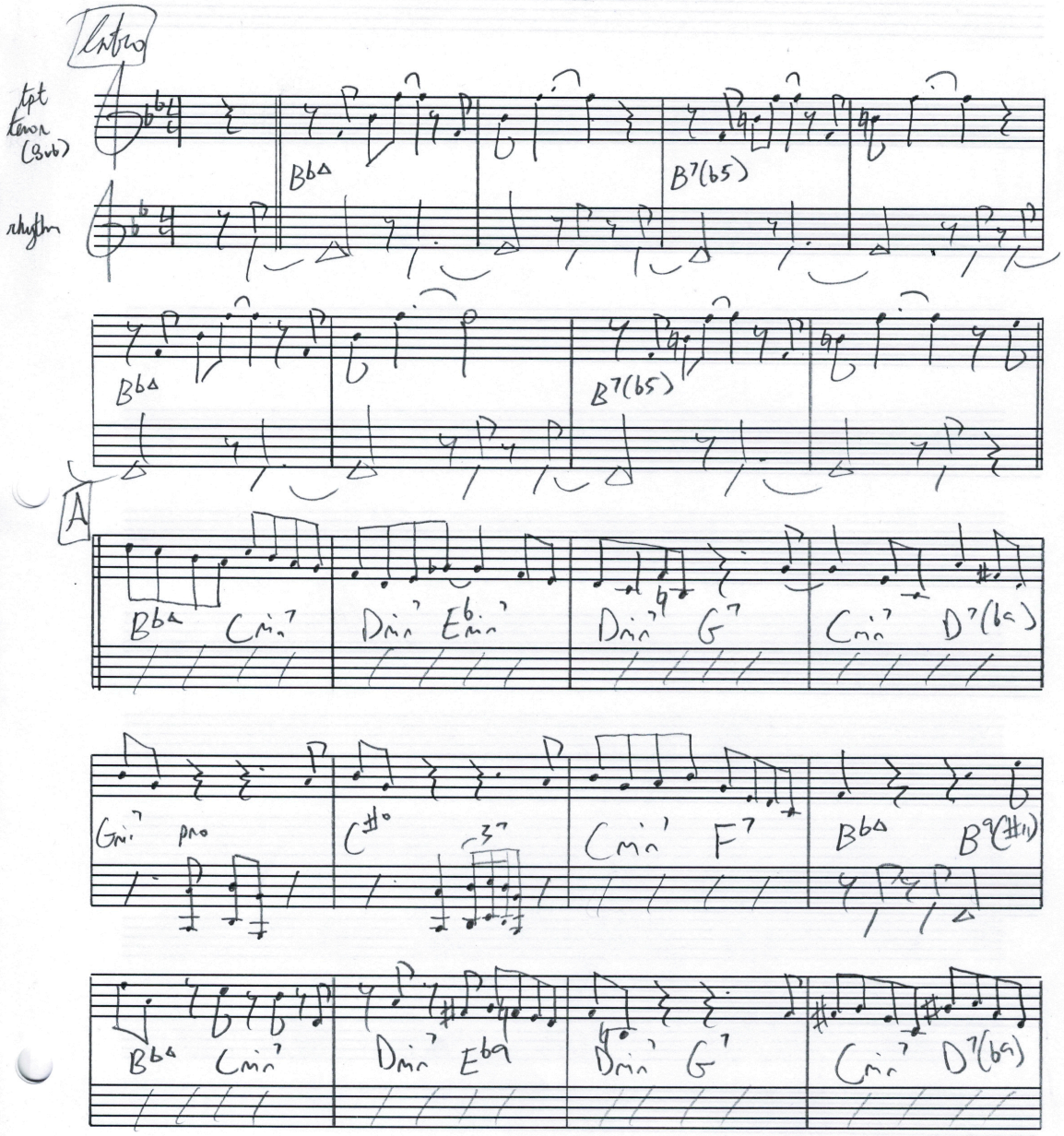
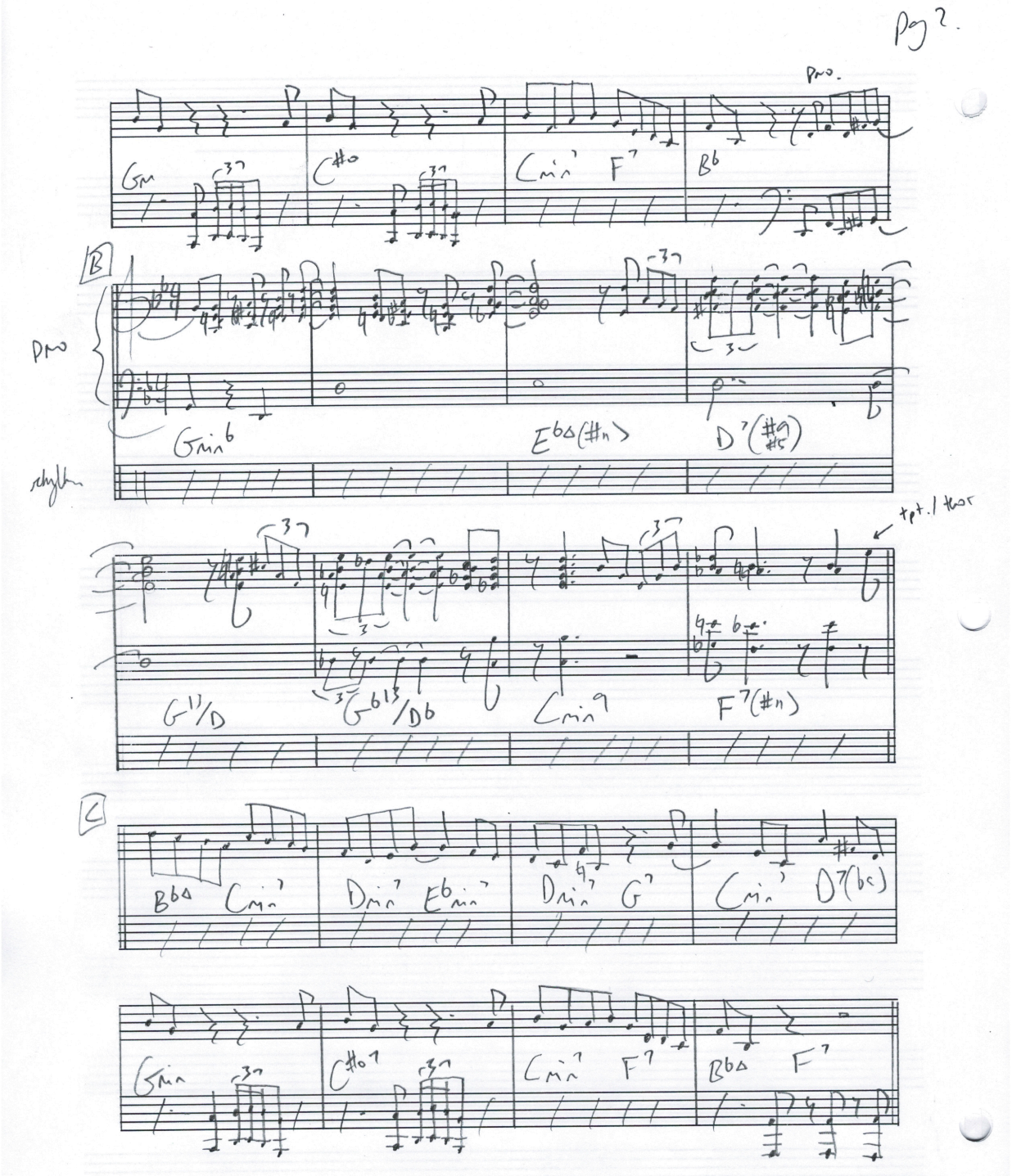
[88] Micheal Chanan, *Repeated Takes: A Short History of Recording and Its Effects on Music*, 7.

[89] Bud Powell, *Bouncin' With Bud,* Blue Note 78-1567, 1949, 78 RPM record.

Bouncin' With Bud 1949




Pg 2.
Pno.
Gm
C#o
Cmin7
F7
Bb
B
Pno
Gmin6
Eb△(#11)
D7(#9 #5)
rhythm
tpt. / tbn
G11/D
Gb13/Db
Cmin9
F7(#11)
C
Bb△
Cmin7
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F7

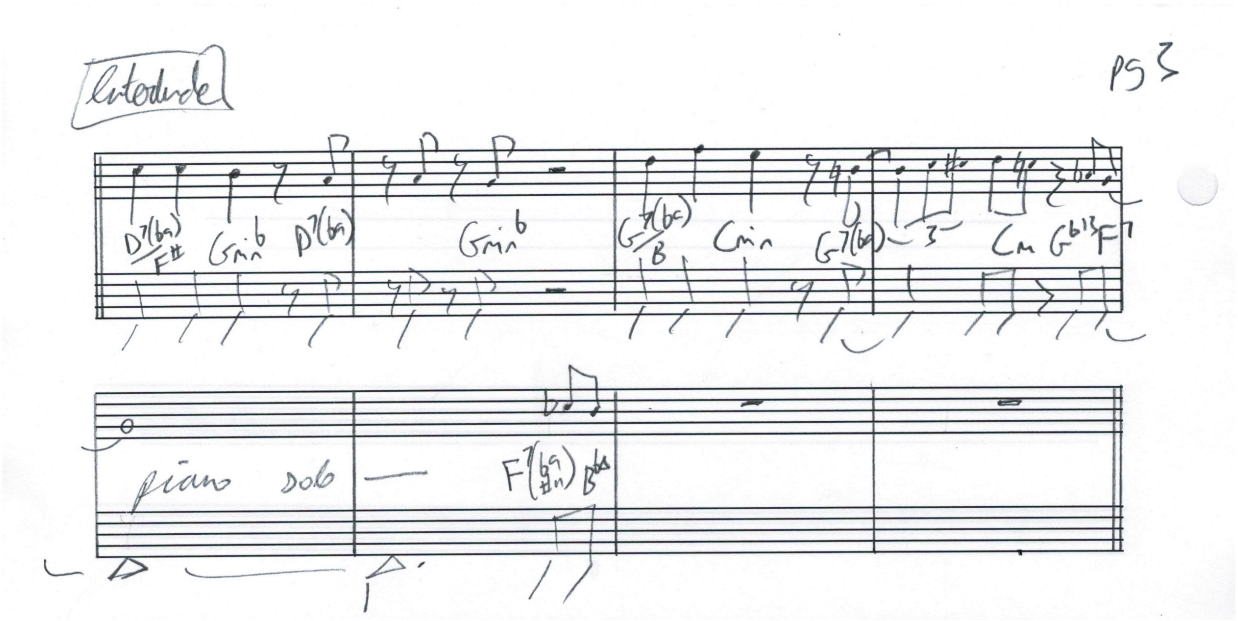

Figure 5.2. A lead-sheet for "Bouncin With Bud" transcribed from the 1949 78 RPM release on Blue Note.

A particular challenge in transcribing a lead-sheet from a recording presents itself in deciphering compositional intent. Corea acknowledges this challenge by stating "my task was to be as aware of Bud's intent for his compositions as I could be." Corea's position here aligns with a fundamental problem in music studies: the "intentional fallacy" and its relation to what constitutes the musical work or composer's vision. Corea adds: "In jazz, it's common practice for a composer/performer such as Bud to constantly alter his compositions in actual performance."[90]

In notating the transcription in figure 5.2, I had to make editorial choices. For example, in the fifth and sixth bar of the interlude, I've notated "piano solo" as the rest of the band holds the notes first articulated on the second half of the fourth beat in the fourth bar. This was an intuitive decision as to which aspects of the music are composed and which are improvised. I believed this passage to be improvised and intended my transcription to privilege compositional intent. In figure 5.3 I've transcribed the figure that Bud Powell plays in these bars.

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[90] Chick Corea, *Remembering Bud Powell,* (liner notes), Stretch Records SCD-9012-2, 1997, CD.

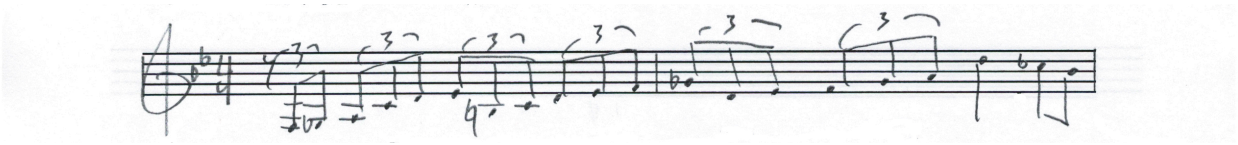

Figure 5.3. Bud Powell's "piano solo" in bars five and six of the interlude to "Bouncin' With Bud."

The 2001 Rudy Van Gelder re-issue of *The Amazing Bud Powell, Vol. 1* includes two alternate takes of *Bouncin' With Bud.*[91] By examining these alternates from the 1949 recording session, I've gained a greater understanding of Powell's compositional intent. In the bars labeled "piano solo" of the alternate take labeled #2, Powell plays the identical notes seen in Figure 5.3. My intuition as to the improvisatory nature of the figure is revealed to be incorrect. A closer examination of previously unavailable recorded evidence shows these notes to have been previously composed (or at least worked-out). In figure 5.4, I compare this passage with the alternate take labeled #1.

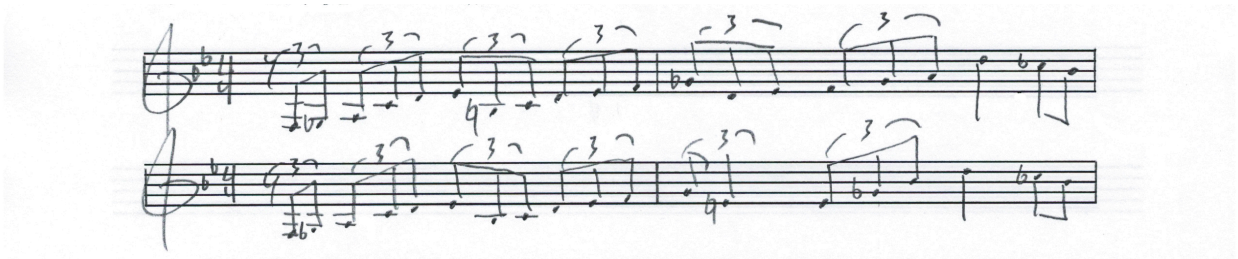

Figure 5.4. Bud Powell's "piano solo" in bars five and six of the interlude to "Bouncin' With Bud." The first line reflects the released take and alternate take #2. The second line is a transcription of this passage from alternate take #1.

In comparing the transcriptions in figure 5.4, I notice a variation in the second bar between alternate take #1 and the released and second alternate takes. My intuition, as to this variation, is that Powell made a mistake on alternate take #1. Powell's E natural on the second eighth-note of the eighth-note triplet on beat one, begins a divergence from the other takes. I hypothesize that the rhythmic expansion of this note corresponds to Powell's sudden need to adjust to his mistake. Not only has he diverged from the pitches and rhythms that I believe he

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[91] Bud Powell, *The Amazing Bud Powell, Vol. 1 (The Rudy Van Gelder Edition),* Blue Note 32136, 2001, CD.

worked-out, but this wrong note diverges from the pool of potential notes from which the figure is drawn. The pool from which the intended notes are drawn is an F half-whole diminished scale. E natural is not a potentiality presented by this scale.

My further study of the alternate takes reveal other slight variations. As in the previous analysis of the interlude, by considering these variations I gained insight into Powell's compositional intent. One example is the variation in Powell's piano playing in bar eight of the intro section. Instead of the rhythmic punctuation around the horn melody notated in figure 7.2 and heard in the released take and alternate take #2, alternate take #1 contains a descending whole-tone glissando. Other variations include slight rhythmic differences in the B (bridge) section. Figure 7.5 compares the piano played in the bridge in the released take with alternate take #1. It can be seen that the piano playing here is worked-out. Only slight rhythmic variations distinguish the takes.

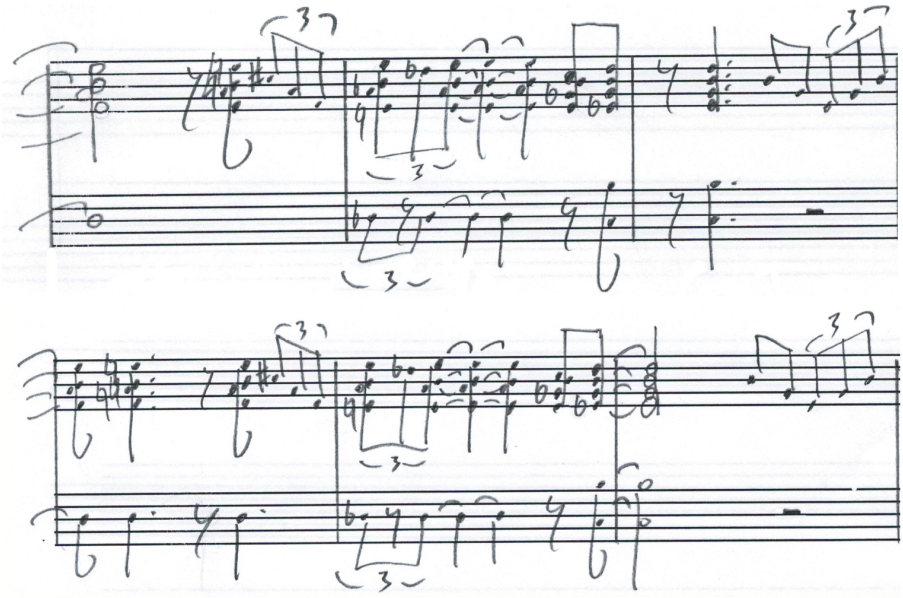

Figure 5.5. Bars five through seven of the bridge. The top stave represents the released take. The second stave is a transcription from alternate take #1. There is a re-articulation of the held chord in bar five and the omission of an articulation in bar seven of the alternate take. Except for these two features, the bridges are identical.

Figure 5.6 outlines a variation in the last bar of the bridge heard in alternate take #2. The bridge in this take is otherwise identical to the released take.

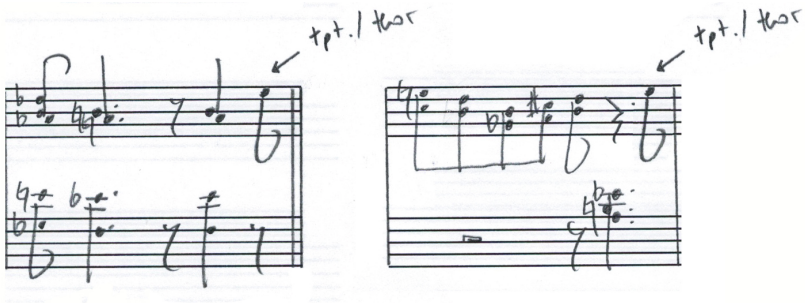

Figure 5.6. Bar eight of the bridge. The transcription on the left is from the released take. The transcription on the right is from alternate take #2.

As exemplified by the previous analyses, knowledge of this music is transmitted aurally by the recorded medium. Deciphering compositional intent is difficult in a tradition that is primarily non-literate. Again, it is not to say that scores and lead-sheets don't exist, but that they possess little authority. In fact, most published lead-sheets, being transcriptions of recordings, are the product of technologically mediated aural transmission. The care taken in considering multiple sources, as well as the skill of the transcriber however, can lead to varying levels of authority.

A skilled jazz musician often needs to decipher recorded evidence to achieve an understanding of the music and its tradition. Returning to Corea's liner notes he states: "Tempos, notes, harmonies-almost any aspect of a composition is subject to change as the concept evolves in the process of playing it over and over. — In the case of Bud's compositions, I tried to arrange the notes in a way that remained true to Bud's intent and also allowed his wonderful ideas to be an interesting springboard for this band."[92]

The following figures compare Chick Corea's recording with that of Bud Powell's. These figures exemplify the transmission of Bud Powell's composition and playing style to Chick Corea via recording.

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[92] Chick Corea, *Remembering Bud Powell,* (liner notes), Stretch Records SCD-9012-2, 1997, CD.

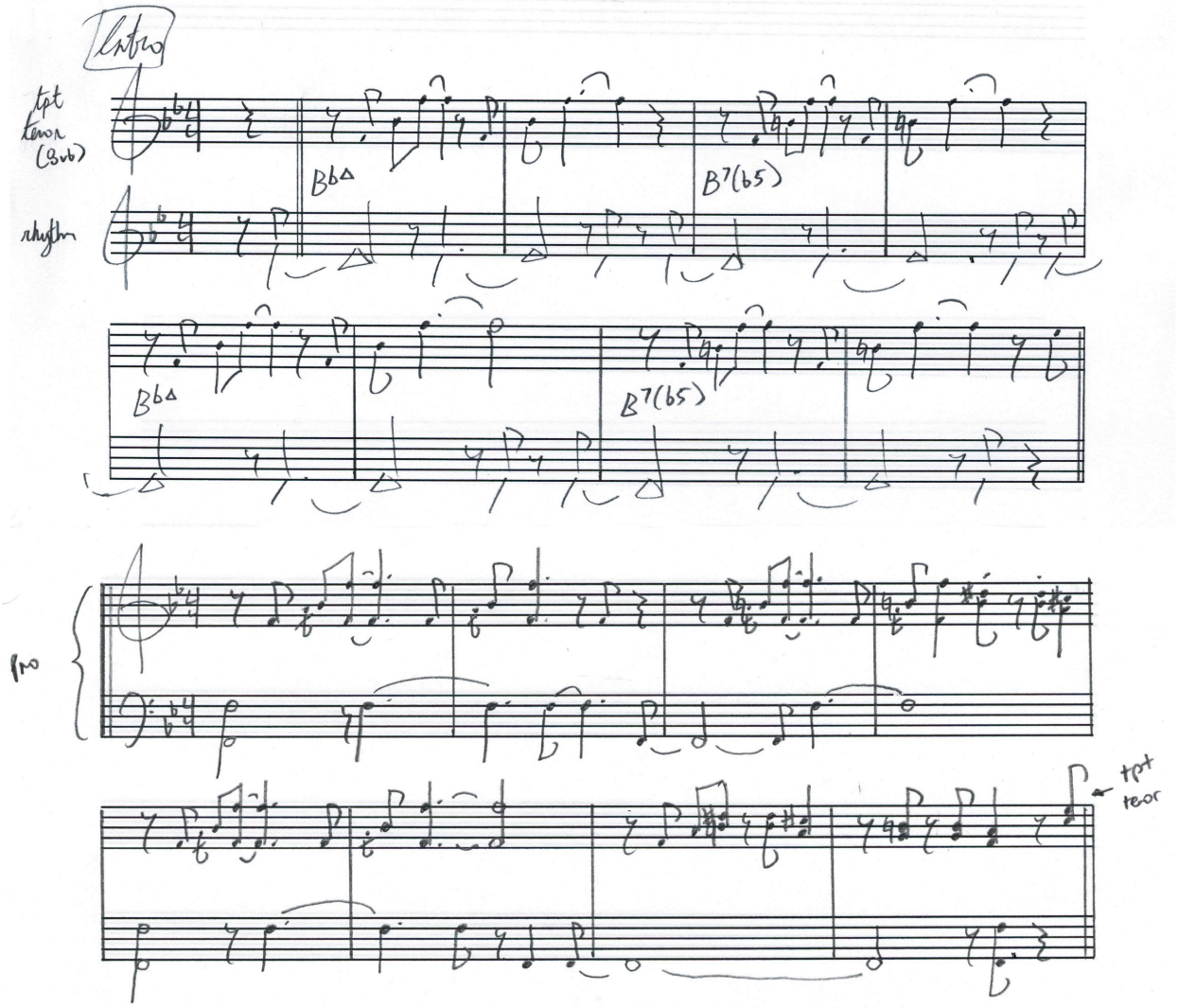

Figure 5.7. A comparison of the intro sections. On top is the transcribed lead-sheet from Bud Powell's recording. On the bottom is a transcription of Chick Corea's Intro.

In presenting this music, Chick Corea has treated Powell's recording as a theme for variation. Some aspects are restated literally, while others are varied or completely reimagined. In Figure 5.7, we see that Corea has changed the instrumentation of the intro. Powell's recording features the trumpet and tenor saxophone stating a repetitive melodic motif while the drums and piano outline a rhythmic counter-figure. In Corea's recording, we hear the piano performing both functions. In the right hand, much of the original melodic motif is heard. In the left hand, much of the rhythmic counter-figure is now playing an F pedal. The extraneous notes added by Corea in bars five, seven, and eight, allude more abstractly to Powell's recordings. In

these bars, Corea is heard to play figures in thirds derived from a whole-tone scale. Although these notes aren't literal references to Powell's composition, I argue that they allude to stylistic potentialities heard in Powell's recordings. As previously mentioned, in bars seven and eight of alternate take #1, Powell played a descending whole-tone glissando. Also, as seen in Figure 5.6, Powell plays a figure in thirds (largely drawn from a whole-tone scale), in the bridge of alternate take #2.

Figure 5.8 is a transcription of Corea's horn arrangement in the A section.

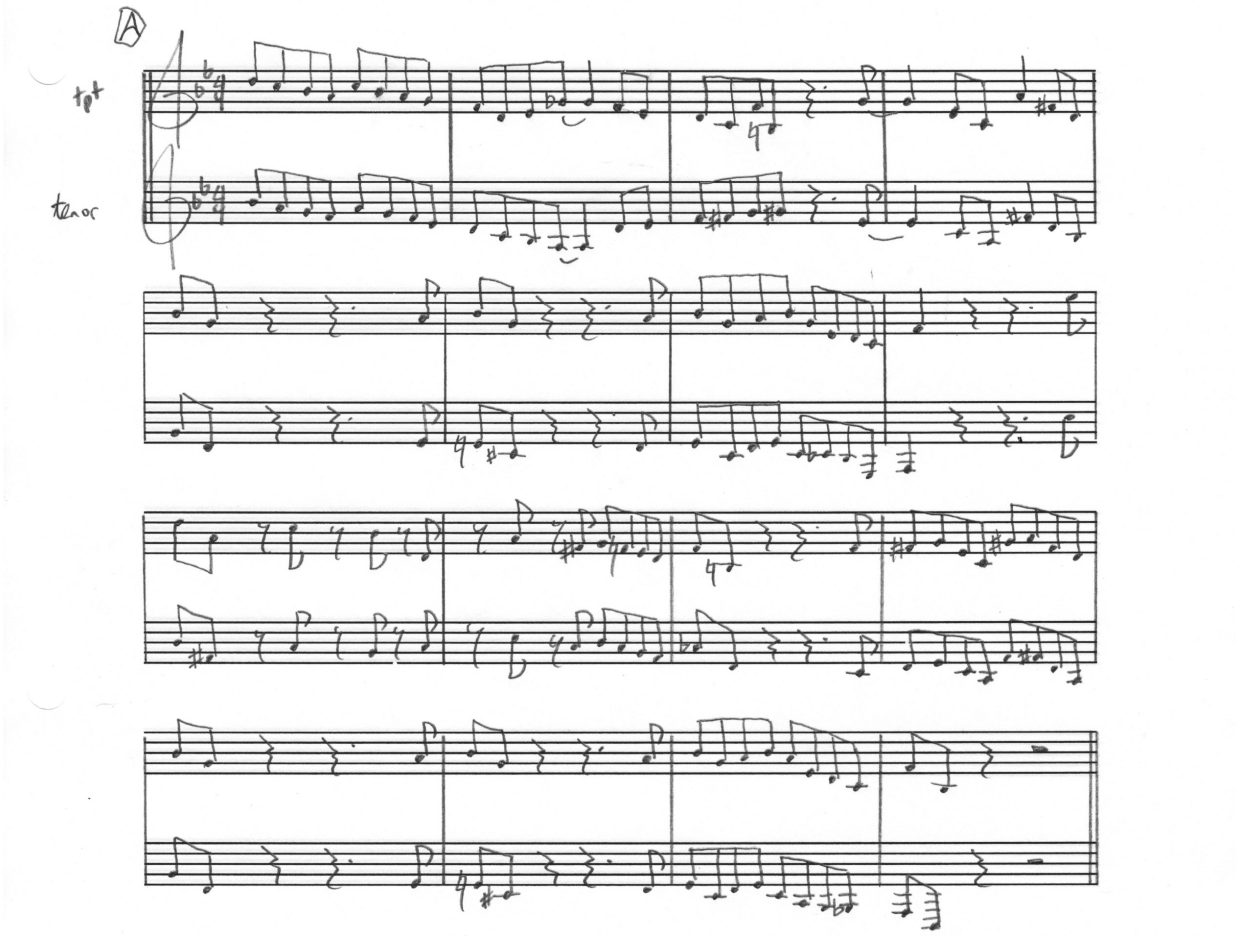

Figure 5.8. A transcription of Corea's horn arrangement in the A section.

In figure 5.8, the trumpet melody in Corea's recording is the same as in Powell's recording. The harmonized tenor saxophone part, however, contrasts Powell's recording in which the horns are separated by an octave. In bar one of the A section, the tenor saxophone

harmonizes the trumpet by diatonic third. In bars two and three, the tenor saxophone begins to move in contrary motion to the trumpet. An interesting aspect of Corea's approach is the harmonic values heard on notes of longer duration. On the second half of beat two in the second bar the horns are separated by tritone. In bar three, contrary motion leads to a crossing of lines as the tenor surpasses the trumpet in register. This motion culminates on the second half of the second beat in bar three. On this note, the trumpet has gone down to a B (the third of a G13(b9) chord), and the tenor has gone up to a G# (or an Ab [the b9 of the G13(b9) chord]). Similar strategies for two-part horn arranging persist throughout the recording.

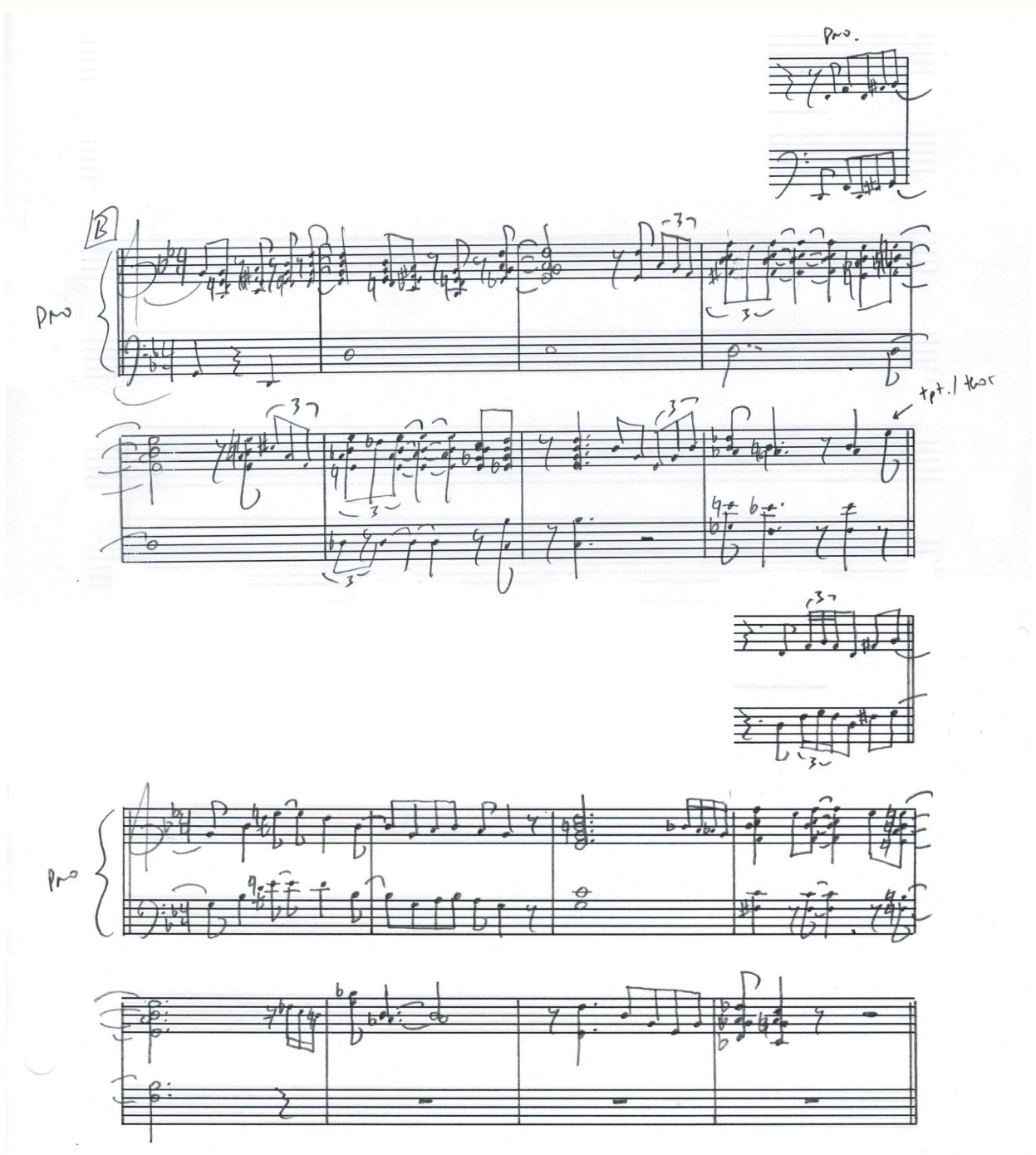

Figure 5.9. A comparison of Powell's original recording of the bridge with Corea's variation.

Figure 5.9 compares Powell's playing in the bridge of the head with Corea's. Close examination reveals Corea's variation on Powell's theme. In comparing the pick-up into the

bridge, with the exception of an added ornament around the F and the left hand being one octave higher in Corea's recording, these phrases are identical. Through much of Powell's bridge his left hand sparsely outlines the root motion. In Corea's recording a much more pronounced bass sound frees him to play rootless chord voicings.

Moving forward, the first two bars of these B sections are substantially different. In Powell's recording, he constructs right hand block-chords to harmonize the notes G, A, Bb, and D by using the notes of either a Gmin6 or an F# diminished 7 chord. Corea alludes abstractly to this harmony by creating a new melody that outlines a Gmin69 chord in octaves. The fourth bars from each recording reveal the greatest similarities. With only slight rhythmic variation, in both recordings we hear D7(#9,#5) chords harmonizing the melody that moves between F and Eb before anticipating the next bar on an E. The difference however, is in the construction of the chords. In Powell's recording he plays a D (the root) in his left hand and the rest of the chord in his right hand. In Corea's recording, he plays the third and seventh of the chord in his left hand and the rest of the chord (including a doubled #9 [F] and a doubled 7th [C]) in his right hand. Similar examples of rhythmic variation, chord construction, and more or less literal allusion to Powell's theme persist throughout the bridge.

Figure 5.10 compares Powell's and Corea's piano-solos in the interlude.

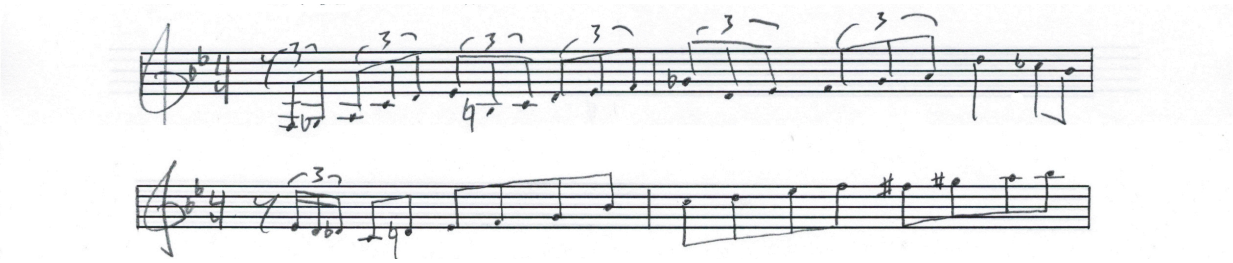

Figure 5.10. A comparison of Powell's piano-solo in the interlude with Corea's passage in the same bars.

In Figure 7.1 we see that Powell's worked-out piano solo through two bars of the interlude is reflected in Corea's playing in only the loosest sense. Other than beginning on the second eighth-note of an eighth-note triplet on beat one, generally ascending, and arriving at a Bb on the second half of beat four in the second bar, these passages have little in common.

Few pitches and rhythms are shared. One important commonality these recordings share however, is that the first seven notes in Corea's second bar map onto an F half-whole diminished scale. As previously outlined, this scale sounds central to Powell's approach in these bars. I argue that Corea is accessing stylistic potentialities heard in Powell's recordings. Not only is compositional intent transmitted, but also theoretical and aesthetic approaches to improvisation. Corea states: "I learned an incredible amount about music and improvising at the piano through him [Powell]."[93]

The previous analyses reveal specific instances of technological mediation of aural transmission. Corea's words and music point to his study of Powell's music as mediated by recordings. *Bouncin' With Bud* has been transmitted "across geography, culture and history"[94] to be reimagined by Corea and others.

My discussion of *Bouncin' With Bud* to this point has been limited in its scope to the head-in. The transcribed lead-sheet attempts to privilege compositional intent by focusing on the initial statement of the melody. Much of the value in each of these recordings, however, is in subsequent improvised choruses. As in the blues form analyzed in Chapter 3, repeated choruses of *Bouncin' With Bud* with similar harmonic progressions to that of the head, provide the foundation for improvised solos. Aspects of these solos will be addressed in chapter 7. Characteristics of the music, including these improvised choruses, will be shown to connect to potentialities privileged by technological mediation.

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[93] Chick Corea, *Remembering Bud Powell,* (liner notes), Stretch Records SCD-9012-2, 1997, CD.

[94] Micheal Chanan, *Repeated Takes: A Short History of Recording and Its Effects on Music*, 7.

Chapter 6 - Recordings: developing an analytical framework

In *The Art of Mixing: A Visual Guide To Recording Engineering and Production,* David Gibson states:

> *In other fields of art, there is no shortage of books that attempt to explain the whole world of aesthetics. From music to finger painting, scholars have tried answering the question, "What makes great art?" But recording is a relatively new field, and very little has been written about the aesthetics of mixing.*[95]

In this chapter, I develop an analytical framework for the discussion of recordings. In chapter 7, elements of this framework will be used to compare Chick Corea's 1997 recording of *Bouncin' with Bud* with Bud Powell's 1949 recording.

Much of this thesis has relied on transcription as a means to integrate non-literate sources into the discourse of musicology. In addition to some question as to how useful notation is as a means of describing sound, the additional step of transcribing presents a considerable barrier. In *Musical Rhythm in the Age of Digital Reproduction,* Tellef Kvift addresses concerns of notation from the standpoints of utility and resolution by first asserting a straw argument that: "Notation is the link between the composer and the performer, and it contains all of the relevant information." The author later acknowledges an inadequacy of resolution by stating: "Standard musical notation, then, is basically digital."[96] To understand this, I must consider the differing roles notation can play. Western notation doesn't describe sound but serves to communicate instructions to someone who understands them. Stylistically appropriate interpretation, nuance, and more is added by the performer. To be analogous to sound, notation would need to include all of the subtly of the performance. Music notation can't do this. Notated music is often quantized into divisions of time and pitch that are easily read and appropriately varied.

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[95] David Gibson, *The Art of Mixing: A Visual Guide To Recording Engineering and Production,* (Vallejo, CA: Mix Books, 1997), x.

[96] Tellef Kvift, "Composing a Performance: The Analogue Experience in the Age of Digital (Re)Production," *Musical Rhythm in the Age of Digital Reproduction,* ed. Anne Danielson, (Surrey, England: Ashgate Publishing, 2010), 220-224.

From this standpoint, the transcriptions included in this thesis are similarly limited. For example, rhythmic approximation accounts for many of the differences seen between figures 3.3, 3.4, 3.5, 3.6, and 3.7. In the second bar of each figure, a similar rhythm is notated differently. Each example is distinct in sound from the others but similarly distinct from a hypothetical literal performance of its corresponding notated figure. To fit sound within a quantized framework, a decision is made as to which approximation seems the closest. Previous mentions of swing-eighth notes and straight-eighth notes also point to a lack of resolution. Music notation doesn't easily accommodate these subtleties. "[It] becomes rather problematic when one 'increases the resolution' of the analysis;"[97] analogous notation would be prohibitive.

More fundamental however is the utility of music notation in jazz music. Returning to the straw argument that "notation is the link between the composer and the performer,"[98] despite the shortcomings of this definition, it is an appropriate approximation of notation's function in most literate music forms. That is, a performer is provided the pitches and rhythms and it is hoped they can turn them into music. This is fundamentally different from the utility of notation in jazz music or in this thesis. As previously stated: jazz music is transmitted primarily through aural and oral means. Although written scores and lead-sheets exist, they generally convey only a basic outline to be interpreted and embellished by a jazz musician. Notation in jazz music is therefore even less analogous to sound. In addition, in the case of *Bouncin' With Bud,* it was shown that recordings (not notation) are the link between composer and performer.

In some sense, the notation used in this thesis serves an inverse function to the given definition. Stylistically appropriate interpretation of the recorded evidence is needed to create a transcription. I have to imagine subtleties between sound and notation in a process that is the reverse of a performer. For a reader to understand the transcriptions, therefore, it would seem

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[97] Ives Chor, "Microtiming and Rhythmic Structure in Clave-Based Music: A Quantitative Study" *Musical Rhythm in the Age of Digital Reproduction,* ed. Anne Danielson, (Surrey, England: Ashgate Publishing, 2010), 21.

[98] Tellef Kvift, "Composing a Performance: The Analogue Experience in the Age of Digital (Re)Production," *Musical Rhythm in the Age of Digital Reproduction,* ed. Anne Danielson, 220-224.

to require that they imagine similar disparities between notation and sound. As an alternative, they could listen to the recordings. Transcriptions, such as those in this thesis, are practically useful for comparative analysis and jazz pedagogy, but they can't describe sound. For example, I've never heard a bar-line. Karlheinz Stockhausen states that: "The musician—for whom the question of research in sound had become acute for the first time—had to rely to a large extent upon [their] own practical investigations," hinting at an alternative that "[s]ound analysis with electrical filters is comparable to the analysis of light with the aid of prisms."[99] My previous analyses have been practical investigations; in this chapter I introduce audio-meters, graphs, and image-maps as means to research sound.

This analytical framework separates characteristics of recording and broadcast mediums into recorded length, dynamic range, frequency range, and spacial image. Differences in these characteristics can be heard between: AM and FM radio, 78 RPM and 33 RPM LP, LP and analogue tape, analogue tape and various digital formats, etc. As these variables are not independent, this separation is partially arbitrary. For example, the duration of a possible recording on an LP is inversely proportional to the amplitude and low frequency content of the music. When an analogue tape machine is reaching the limits of its dynamic range, it is often indicated by a reduction in frequency range (harmonic distortion). The dynamic ranges of some mediums differ over their frequency ranges and vice-versa.

6.1 Recorded Length

Of the characteristics included in this analytical framework, the recorded length is the easiest to discuss and demonstrate. Many of the recordings discussed so far have been less than three minutes in length. This musical characteristic corresponds directly to a potentiality afforded by a recorded medium. That is, a ten inch 78 RPM record can reproduce about three

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[99] Karlheinz Stockhausen, "Electronic and Instrumental Music," *Audio Culture: Readings in Modern Music,* ed. Christoph Cox and Daniel Warner, (New York: Bloomsbury, 2004), 371.

minutes of music per side. Table 6.1 outlines the recorded lengths possible with various recorded mediums.

Medium	**Recorded Length**
Wax cylinder	2 - 2.5 minutes (depending on grooves per inch and rpm)
78 RPM record	about 3 minutes per side
45 RPM record	about 5 minutes per side
33 RPM LP	about 22 minutes per side
Reel to reel analogue tape	depends on tape length and speed. eg. 2500’ at 15 ips ≈ 33 minutes.
Compact disc	80 minutes
SACD	110 minutes
DVD audio	74 minutes

Table 6.1. Recording lengths of various recording mediums.

6.2 Dynamic Range

Dynamic range corresponds with the range of possible amplitudes that can be transmitted by a recorded medium. Zero decibels below full scale (0dBFS) references the maximum amplitude reproducible without distortion. Possible amplitudes within a dynamic range are relative to this point and are expressed using the negative unit: dBFS. The minimum amplitude reproducible by a recorded medium is equivalent to its noise level. Music at an amplitude lower than the noise level is not audible. The range between the maximum amplitude and the noise level is expressed as the signal to noise ratio (SNR). For example, the stated SNR of a Studer PR99III reel to reel analogue tape machine running at 15 inches of tape per second (ips) is 66dB.[100] In comparison, the stated SNR of an RME Fireface-400 digital interface is 110dB.[101]

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[100] Studer Professional Audio AG, *PR99 MKIII Technical Documentation,* 2/2.

[101] RME Fireface-400, *User’s Guide,* 88.

Decibels are a log 10 unit and express ratios between values; 0dB, therefore, represents a ratio of 1. Compared to this reference value, 66dBFS corresponds with a ratio of approximately 0.0005 (again, dBFS is a negative unit). In other words, an amplitude of 66dBFS is approximately 2000 times quieter than 0dBFS. 110dBFS corresponds to a ratio of approximately 0.000003 and is therefore approximately 333,333 times quieter than 0dBFS. It is clear that the range of amplitudes reproducible by an RME Fireface-400 is vastly greater than the range of amplitudes reproducible by a Studer PR999III tape machine. Table 6.2 outlines the dynamic ranges of recording and broadcast mediums.

Medium	**Dynamic Range (SNR)**
Wax cylinder	20-30dB
AM radio	48dB
78 RPM record	40dB
FM radio	70dB
45 RPM record	45dB
33 RPM LP	50-75dB
Reel to reel analogue tape	60-70dB
Compact disc	90dB
SACD	120dB
DVD audio	144dB

Table 6.2. Dynamic ranges of various recording and broadcast mediums.

Complicating this analysis is the agency that a recording engineer possesses in determining the dynamic range of a recording or broadcast. In the chapter How To Manipulate Dynamic Range for Fun and Profit, from *Mastering Audio: The Art and the Science,* Bob Katz includes figures that plot time versus amplitude to illustrate the effects of dynamics compression and limiting.[102]

[102] Robert A. Katz, *Mastering Audio: The Art and the Science,* (Waltham, Massachusetts: Elsevier/Focal Press, 2002),119.

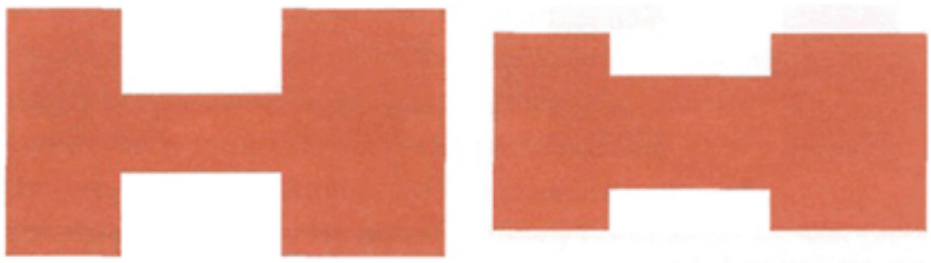

Figure 6.1. On the left is an uncompressed tone burst changing from high amplitude to low amplitude and then back. On the right is the same tone burst amplitude sequence passed through a compressor with a very fast attack time, a high compression ratio, and a fast release time.

In figure 6.1, the waveform on the right is seen to have a reduced range between loud and quiet. One can imagine this process as a negative as this reduction in dynamic range is ultimately a reduction in audio fidelity. However, if the low amplitude portion of the figure on the left is below the noise floor of whatever recording format we are using and the loud portion is near the peak, only by compressing the signal before recording would all of its constituent parts be audible. In considering recording formats with small dynamic ranges, this type of process is often a necessity. The application of this type of process to recording formats with larger dynamic ranges, however, is often an aesthetic choice. This sound became privileged. Fidelity to this privileged aesthetic is relayed into subsequent mediations. The notion of fidelity to aesthetics as distinct from technological fidelity in a conventional sense is addressed in numerous writings.[103,104,105]

Similar discussions of dynamic range will be fundamental to the analysis in chapter 7.

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[103] Alexander B. Magoun, "The Origins of the 45rpm Record at RCA Victor 1939-1948," *I sing the body electric: Music and Technology in the 20th Century,* ed. Hans-Joachim Braun, (Baltimore, Maryland: John Hopkins University Press, 2002).

[104] Micheal Chanan, *Repeated Takes: A Short History of Recording and Its Effects on Music*.

[105] Jonathan Sterne, *The Audible Past: Cultural Origins of Sound Production.*

6.3 Frequency Range

It is widely held that the frequencies discernible by the human ear range from 20 hertz (Hz) to 20,000 Hz (20kHz). However, within that range are differing sensitivities that can change over the course of a listener's life. Figure 6.1 is an equal loudness contour that demonstrates our unequal perception of frequency.

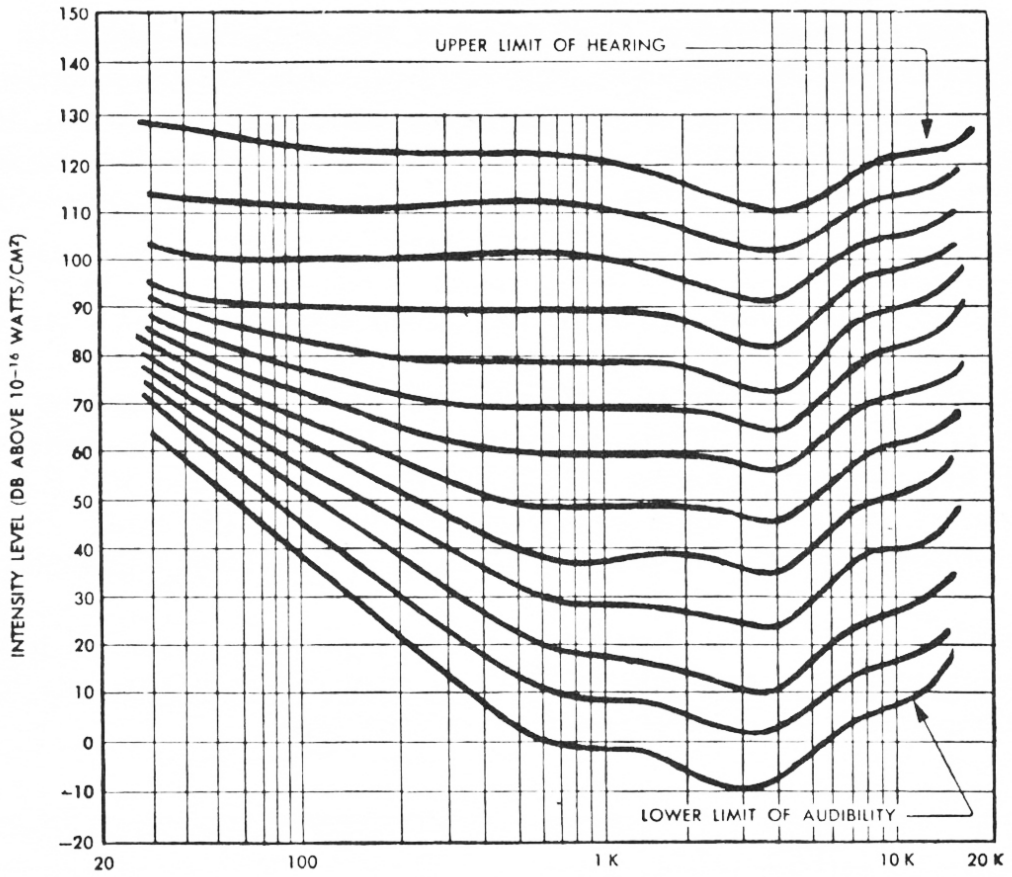

Figure 6.2. "Equal Loudness Contour" based on the studies of Fletcher and Munson.[106]

Figure 6.2 plots the differing levels at which listeners perceive sine waves as equally loud. The scale of the X-axis ranges from 20 to 20,000Hz. The Y-axis plots the sound pressure level in decibels above 10^{-16} watts/cm^2. Between 1kHz and 5kHz, the curves are at their lowest levels. The lowest dip in each curve occurs between 3kHz and 4kHz. These dips correspond

[106] Barry Truax, *Handbook For Acoustic Ecology,* (Vancouver, BC: A.R.C. Publications, 1978), 46.

with the lowest sound pressure required for a listener to perceive a sine wave as equally loud to sine waves at other frequencies. That is, our hearing is most sensitive between 1kHz and 5kHz. In examining the third curve from the bottom in this figure, we see that between 3kHz and 4kHz, a 10dB sine wave sounds to be equally loud as a 40Hz sine wave at 70dB. The significance of this unequal response becomes evident in examining the frequency ranges of various recording and broadcast mediums outlined in Table 6.3.

Medium	**Frequency Range**
Wax cylinder	160Hz - 3kHz
AM radio	50Hz - 6kHz
78 RPM record	40Hz - 11kHz
FM radio	40Hz - 15kHz
45 RPM record	40Hz - 11kHz
33 RPM LP	30Hz - 25kHz
Reel to reel analogue tape	20Hz - 18kHz
Compact disc	up to 22.05kHz
SACD	20Hz-20kHz (with equal dynamic response)
DVD audio	up to 96kHz

Table 6.3. Frequency ranges of various recording and broadcast mediums.

As much as certain types of speech and music are privileged by the recording medium, so too are sound characteristics. Recording engineer Rudy Van Gelder acknowledges fidelity to AM radio in describing aesthetic choices made in his studio. These choices aimed to recreate the limitations of earlier broadcast mediums, despite advances in the state of recording.[107] Fidelity to AM radio is confirmed by Alexander Magoun who recounts that:

[107] Rudy Van Gelder, "To The Highest Peak - An Interview With Rudy Van Gelder," Interview by Sasha Zan, *Tape Op.,* Sept/Oct, 2004, 46.

> *The question of what constituted fidelity and whether it was a desirable goal arose anew with electrification. Trade demonstrations of a record that more than doubled the frequency range of transcription recordings in late 1931 led to discussions about why the public and many of the attendees preferred more limited response. Tests performed at RCA in 1939 also suggested that the standard would have to be no higher than it was for 78s or amplitude-modulated (AM Radio).*[108]

By comparing figure 6.1 with table 6.2, it is evident that the frequency range of AM radio (50Hz - 6kHz) privileges the range in which human hearing is most sensitive (up to 5kHz). In considering subsequent mediations with larger potential frequency ranges, fidelity to the range of AM radio is often heard. Figure 6.3 is a spectral analysis of *Afternoon In Paris* from the Phineas Newborn Jr. album *Here is Phineas* recorded at Hackensack Studio by Rudy Van Gelder in 1956.[109] This analysis reveals Van Gelder's fidelity to AM radio and the frequency range privileged by that medium.

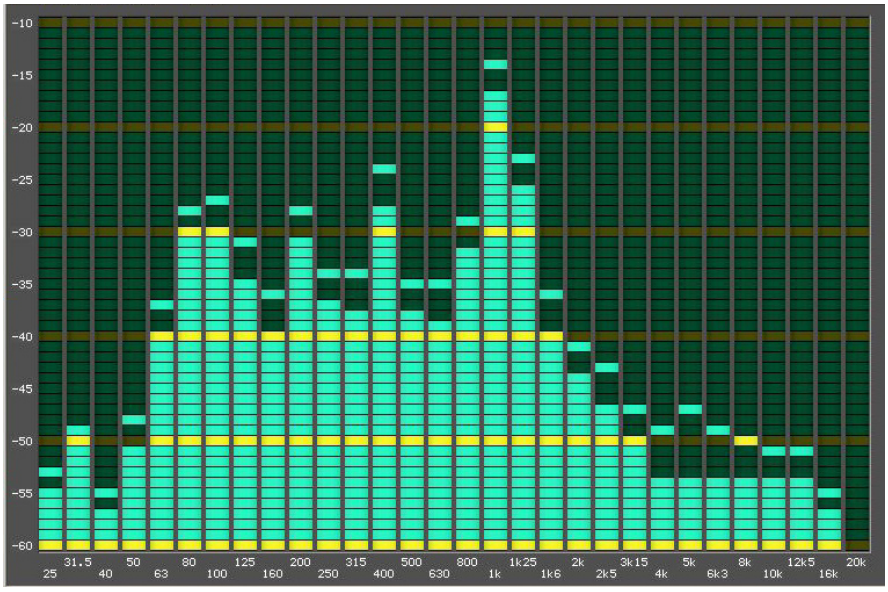

Figure 6.3. A spectral analysis of "Afternoon in Paris" by Phineas Newborn. Recorded by Rudy Van Gelder at Hackensack Studio in 1956.

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[108] Alexander B. Magoun, "The Origins of the 45rpm Record at RCA Victor 1939-1948," *I sing the body electric: Music and Technology in the 20th Century,* 151.

[109] Phineas Newborn Jr., *Here is Phineas: The Piano Artistry of Phineas Newborn Jr.*, Atlantic 1235, 1957, LP.

As heard in listening to the album and reflected in figure 6.3, the tone of *Here's Phineas* features a strong emphasis in frequencies surrounding 1kHz. At times this emphasis reaches the point of audible distortion. The musical content above 4kHz is often below the noise floor.

Van Gelder claims a motivation to "get electronics to accurately capture the human spirit." He strived for an aesthetic that would sound "as warm and as realistic as possible."[110] In a 2004 interview, however, Van Gelder outlined a key step in his production method: "We would broadcast on the AM band out to the car and hear it that way."[111] Taken on a whole, these comments would suggest Van Gelder's motivation was to create a sound as warm and realistic as possible within the potentialities privileged by AM radio and despite advances in the state of recording technologies.

Similar discussions of frequency range will be fundamental to my analysis in chapter 7.

6.4 Spacial Image

Alan Dower Blumlein holds the first patents for stereophonic recording and created some of the first stereo recordings in the 1930s. "The ability to present the illusion of physical reality"[112] represented a previously unavailable potentiality. With this new technological potentiality came a new dimension in listening. "When we imagine a sound, like a vocal, to be between the speakers, there is, in actuality, no sound there. The same sound is coming out of both speakers, travelling throughout the room, and we just imagine the sound to be between the speakers."[113]

As a stereo image is imagined, David Gibson proposes a qualitative approach to mapping "the space between the speakers."[114] By attending to the perceived volume,

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[110] Rudy Van Gelder, "'Phantom' Studio Turns Out Jazz Classics," Interview by Joseph P. Griffith, *The New York Times (New Jersey Weekly Desk)*, May 22, 1988.

[111] Rudy Van Gelder, "To The Highest Peak - An Interview With Rudy Van Gelder," Interview by Sasha Zan, *Tape Op.*, 46.

[112] Virgil Moorefield, *The Producer as Composer,* xv.

[113] David Gibson, *The Art of Mixing: A Visual Guide To Recording Engineering and Production,* 8.

[114] David Gibson, *The Art of Mixing: A Visual Guide To Recording Engineering and Production,* 9.

frequency, and panning of each instrument, a visual representation of an audio recording becomes possible.

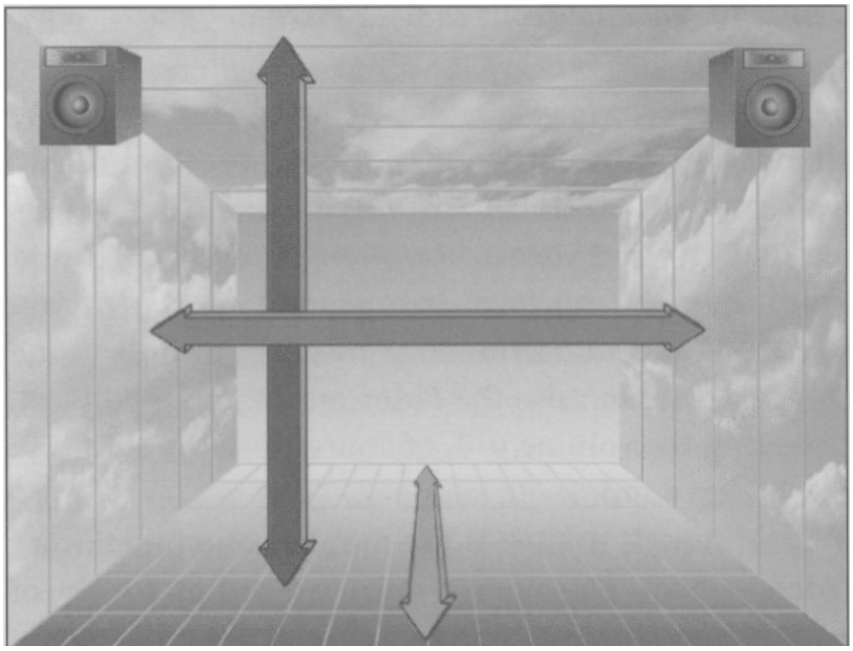

Figure 6.4. Mapping volume, frequency, and panning from "The Art of Mixing: A Visual Guide to Recording, Engineering, and Production."

Figure 6.4 illustrates the imagined spacial characteristics of a recording. The Y-axis corresponds with a qualitative perception of frequency. High frequency sounds appear towards the top of the graph while low frequency sounds appear towards the bottom. The X-axis represents the perception of stereo image or panning. An instrument that is imagined as coming from the left speaker is represented on the furthest left side of the graph. An instrument that is imagined as coming from the right speaker is represented on the furthest right side of the graph. An instrument that is imagined to sound as coming from anywhere between the speakers would be represented correspondingly on the X-axis. As a mono recording is made up of only one channel, its playback on a stereo system would send that signal equally to the right and left. The listener would imagine the entire recording to be coming from midway between the speakers. This mono sound would be represented in the centre of the X-axis. The Z-axis represents the perception of volume. This representation presumes that a quieter sound

is perceived as further away and vice-versa. A louder or closer sound will be represented as larger than a quieter or more distant sound.

A quantitative analysis of a recording's potential for stereo image is also possible.

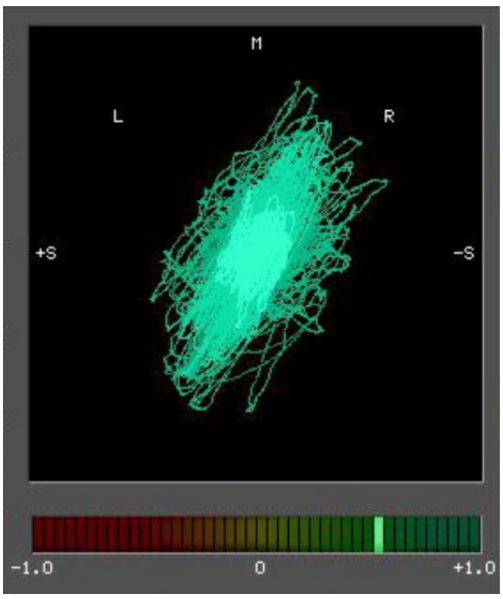

Figure 6.5. A vector audio scope analysis of "Afternoon in Paris" by Phineas Newborn. Recorded by Rudy Van Gelder at Hackensack Studio in 1956.

Figure 6.5 is a vector audio scope and correlation meter analysis of Phineas Newborn's recording of *Afternoon in Paris.* This meter makes visible "the level and phase differences between left and right channels."[115] A vector audio scope displays a mono signal as a vertical line. Signals panned to the left and right slope up to the left and right accordingly. A display reaching further from its central point corresponds with greater amplitude. The correlation meter (along the bottom) indicates the calculated correlation between the left and right channels. A mono recording sent at the same level to left and right channels would read as +1.0 on a correlation meter. If the phase of the same signal was inverted 180° in one of the two channels, the correlation meter would read -1.0.

Similar discussions of stereo image will be fundamental to the analysis in chapter 7.

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[115] RME, *DIGIcheck Help: The Vector Audio Scope, Theory and Usage.*

Chapter 7 - *Bouncin' With Bud*: technological potentialities and musical characteristics

Bud Powell's 1949 recording of *Bouncin' With Bud* was recorded at WOR Studios in New York for release as a 78 RPM record (Blue Note 78-1567). This format has a recording length of about three minutes per side, a dynamic range of about 40dB, a frequency range between 40Hz and 11kHz, and is mono. It is uncertain in which format Chick Corea's 1997 recording was initially made, however, Mad Hatter Studios claims it "provides cutting edge audio recording and mixing equipment."[116] *Remembering Bud Powell* was released on LP and CD (Stretch Records SLP2-9012-1 /SCD-9012-2). As this analysis uses the CD as its source, that format's characteristics will be referenced. A CD is characterized by up to eighty minutes of recording, a 90dB dynamic range, a frequency range up to 22.05kHz, and stereo sound.

7.1 Recorded Length

Notable characteristics of recorded bebop and jazz music from the 1930's and 40's include concise solos and abbreviated arrangements. As a 78 RPM record can reproduce only about three minutes per side, it is not surprising that the form heard on Powell's recording reflects this limitation. Powell "had to develop whole new performance techniques in order to produce 'originals' suitable for reproduction."[117] Corea's seven minute and fifty-eight second recording is heard to restate portions of the composition and afford expansive improvisations. Figure 7.1 maps the musical forms of each recording.

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[116] "Mad Hatter Studios," Yellowbot, accessed June 24 2021, https://www.yellowbot.com/mad-hatter-studios-los-angeles-ca.html.

[117] Jonathan Sterne, *The Audible Past: cultural origins of sound production, 26.*

Bud Powell

|----------8 bars----------|

INTRO: tpt, ten, piano, bass, drums.

A: (head) tpt, ten, piano, bass, drums.

B: (head) piano, bass, drums.

C: (head) piano, bass, drums.

INTERLUDE: tpt, ten, piano, bass, drums. (drum break)

A: tenor solo

B: trumpet solo

C: trumpet solo (continues)

A: piano solo

B: piano solo (continues)

C: piano solo (continues)

A: (head) tpt, ten, piano, bass, drums.

fine.

3:02

Chick Corea

|----------8 bars----------|

INTRO: piano, bass.

A: (head) tpt, ten, piano, bass, drums.

B: (head) piano, bass, drums.

C: (head) piano, bass, drums.

INTERLUDE: tpt, ten, piano, bass, drums. (piano break)

A: piano solo

B: piano solo (continues)

C: piano solo (continues)

A: piano solo (continues)

B: piano solo (continues)

C: piano solo (continues)

INTERLUDE: tpt, ten, piano, bass, drums. (tenor break)

A: tenor solo

B: tenor solo (continues)

C: tenor solo (continues)

A: tenor solo (continues)

B: tenor solo (continues)

C: tenor solo (continues)

INTERLUDE: tpt, ten, piano, bass, drums. (trumpet break)

A: trumpet solo

B: trumpet solo (continues)

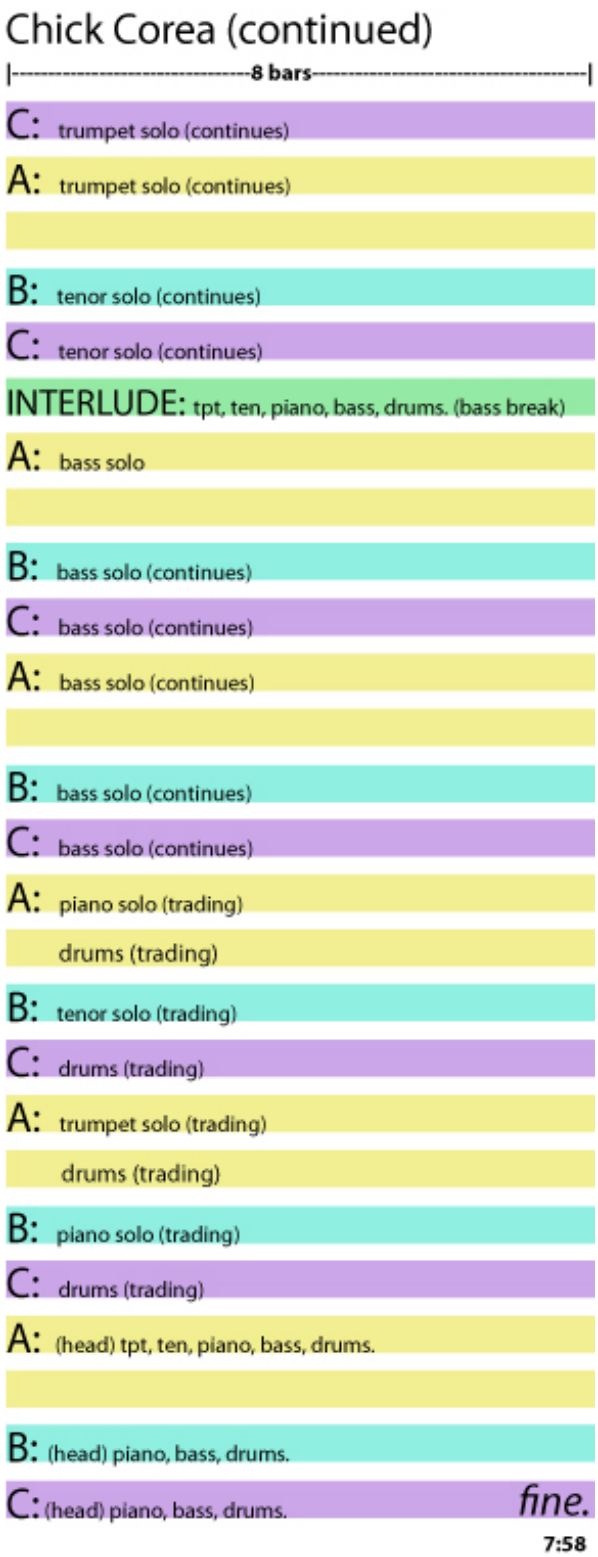

Figure 7.1. Form maps of "Bouncin' With Bud" (each block represents 8 bars of music).

In comparing the forms, the disparate potentialities afforded by each medium and the resulting musical characteristics are evident. A hierarchical solo section is heard in Powell's recording. The tenor saxophone improvises over half a form (A) and the trumpet improvises over the second half (B-C). There are no bass nor drum solos (apart from a two bar break in the interlude). The largest improvised section is allocated to the piano and comprises an entire form (A-B-C).

Chick Corea's recording presents an equal distribution of improvised solos. Each solo is also kicked-off by a restatement of the interlude section. Solos are comprised of two entire forms (A-B-C, A-B-C), before returning to the interlude to begin the next solo. This formal arrangement affords each soloist a greater opportunity to be patient, to listen and respond, and to develop ideas. The two final improvised choruses alternate eight bar solo sections between piano-drums-tenor-drums-trumpet-drums-piano-drums.

In addition to the restatements of the interlude section heard in Corea's recording, is an unabbreviated head-out. While Powell's recording ends after the A section, just at the three minute limit, Corea's includes a complete restatement of the head (A-B-C).

Corea's recording exemplifies a technological affordance producing a concrete result. A particularly interesting point about these recordings is that Roy Haynes is the drummer on both. In the liner notes Corea acknowledges Haynes' insight into the music. Perhaps the expanded form heard on Corea's recording is the way Powell (and Haynes) intended the music to be played in the absence of a three minute time limit.

7.2 Dynamic Range

By comparing the potential dynamic ranges and musical characteristics of Powell's and Corea's recordings a relay of practice is noted. An aesthetic limited by a previous mediation is relayed into a subsequent recording. The potential dynamic range of a 78 RPM record is 40db. The potential dynamic range of a CD is 90db. As decibels are a logarithmic scale expressing ratios relative to a reference (0dBFS), the potential dynamic range of Corea's recording is roughly 316 times greater than is Powell's. Corea's recording, however, indicates fidelity to a limited dynamic range. This is a musical characteristic privileged by a previous mediation. Figures 7.2 and 7.3 plot the peak amplitudes of each recording over their durations.

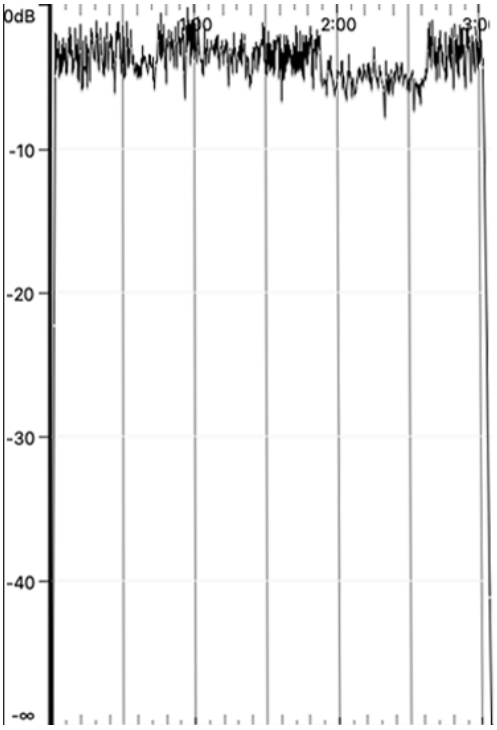

Figure 7.2. Bud Powell's recording: peak amplitude (dB), time (minutes).

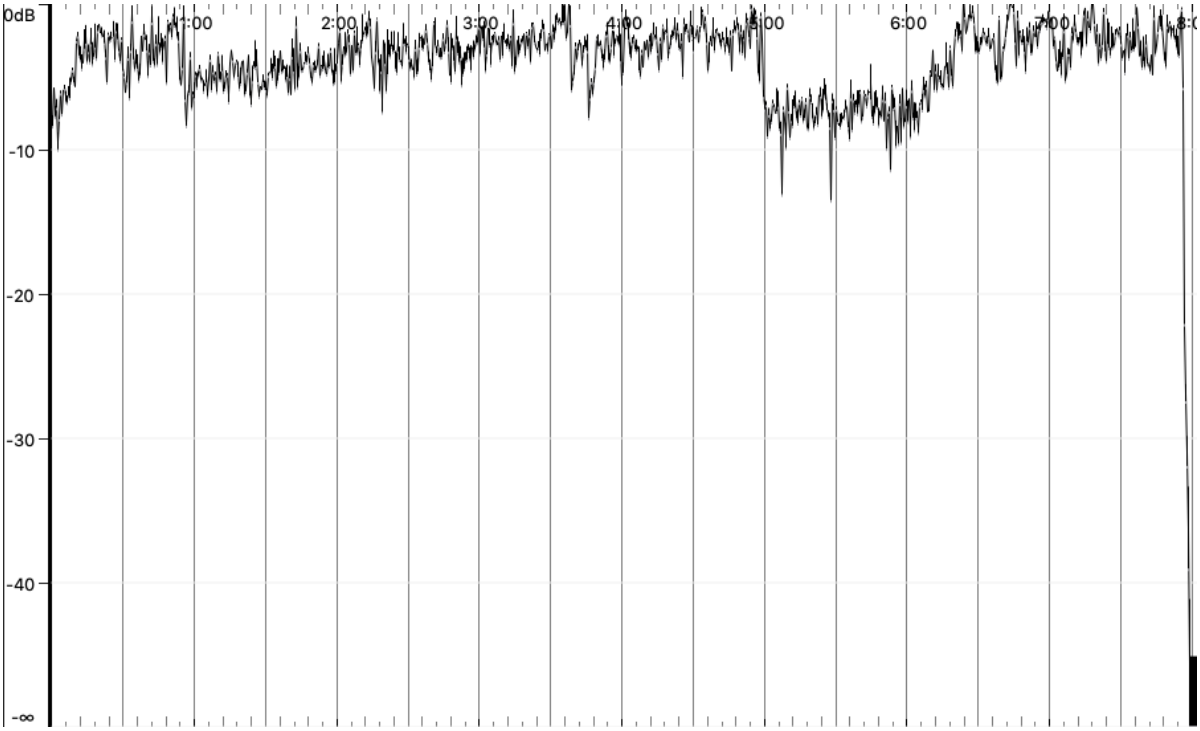

Figure 7.3. Chick Corea's recording: peak amplitude (dB), time (minutes).

It is evident after listening to the recordings and comparing figures 7.2 and 7.3 that the uniformity of dynamic range required of Powell was relayed to Corea as a privileged aesthetic characteristic. Despite the vastly different potentialities presented by the respective mediums, Corea's recording is seen in figure 7.3 to utilize little of this extended range.

Further evidence is revealed by considering the equivalent continuous sound level (Leq) of each recording. The average of peak amplitudes (within a short period of time) is expressed as the root mean square (RMS). This value corresponds more closely with the perceived loudness of a recording than does the peak amplitude. To determine the Leq, the RMS is averaged over the duration of the recording. The Leq of Bud Powell's recording is 18.1dBFS. The Leq of Chick Corea's recording is 17.0dBFS. Despite a potential dynamic range that is roughly 316 times greater (90db versus 40db), Corea's recording is heard, on average, to be 1.1dB closer to its peak amplitude than is Powell's.

There are additional complications to this analysis beyond the inherent ranges of the recording mediums. Powell needed to "develop whole new performance techniques in order to produce 'originals' suitable for reproduction,"[118] given the limitations of 78 RPM records and AM radio. This has been revealed so far to include an abbreviated form and limited dynamic range. In considering Corea's recording, a greater potential is afforded by its mediation to include longer solos and forms. I've characterized Corea's limited dynamic range as a cultural practice relayed by previous mediations. However, despite greater potentials afforded by technological progress, Corea (and others) must still produce originals suitable for reproduction. I hypothesize that "the question of what constituted fidelity and whether it was a desirable goal,"[119] is as relative today as it was in 1939, 1949, or 1997. In many cases, recordings of higher and higher fidelity are being replayed on systems of lower and lower fidelity, iPhones for example.

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[118] Jonathan Sterne, *The Audible Past: cultural origins of sound production,* 26.

[119] Alexander B. Magoun, "The Origins of the 45rpm Record at RCA Victor 1939-1948," *I sing the body electric: Music and Technology in the 20th Century,* 151.

7.3 Frequency Range

In considering the frequency ranges of each recording, the disparate potentialities privileged by their technological mediations are noted. Figures 7.4 and 7.5 illustrate the peak amplitudes, at different frequency ranges, for each recording.

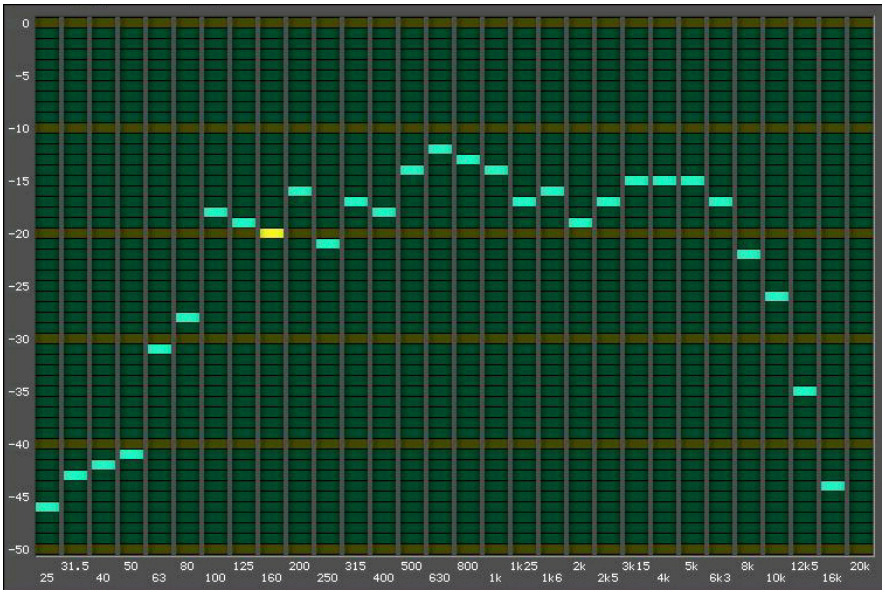

Figure 7.4. Bud Powell's recording: peak amplitude (dB), frequency (Hz).

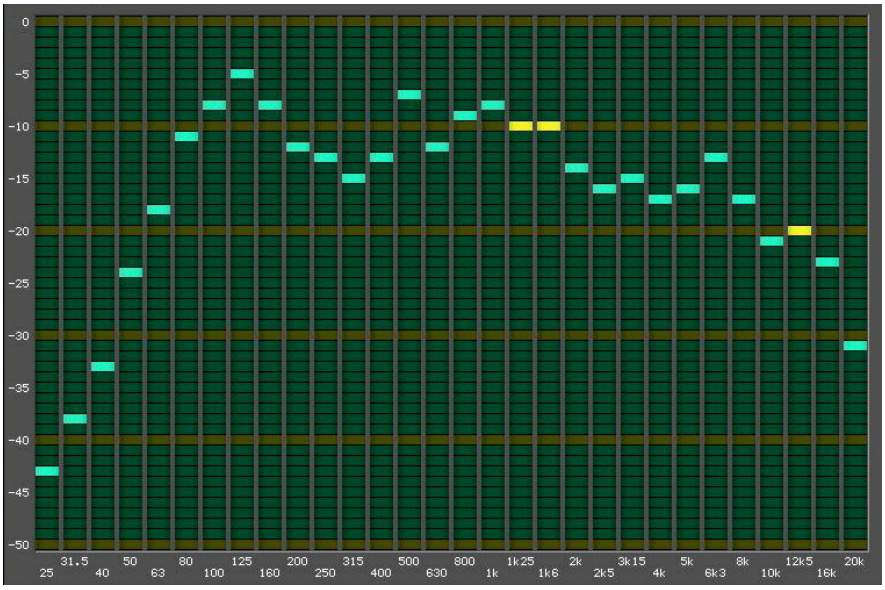

Figure 7.5.Chick Corea's recording: peak amplitude (dB), frequency (Hz).

Figures 7.4 and 7.5 were created by using the peak-hold function of a spectral analyzer. The highest amplitude in Powell's recording is centred around 630Hz. Low and high frequencies are seen to drop-off suddenly at 80Hz and 8kHz respectively. In Corea's recording, the highest amplitude is centred around 125Hz. Low and high frequency drop-offs are seen to be more gradual than in Powell's recording. Corea's recording includes prominent high frequency content up to about 16kHz.

In figures 7.4 and 7.5, spectrograms convey the utilization of frequency range over time. These figures plot frequency in Hz on the Y-axis and time in minutes on the X-axis. Relative amplitude is displayed through colour variation and intensity.

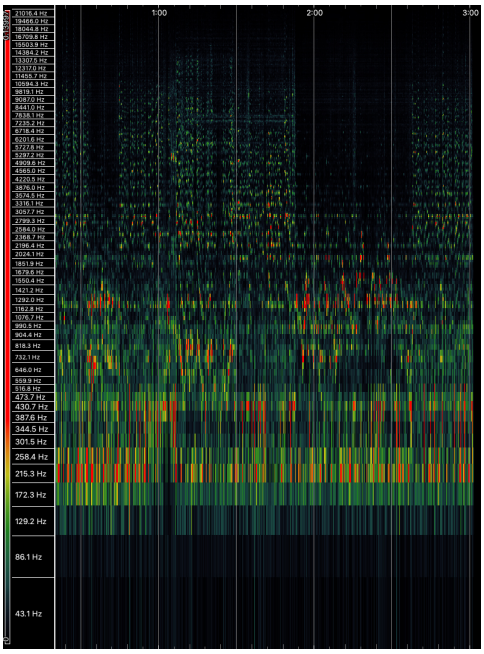

Figure 7.6. Bud Powell's recording: frequency (Hz), time (minutes), intensity (colour).

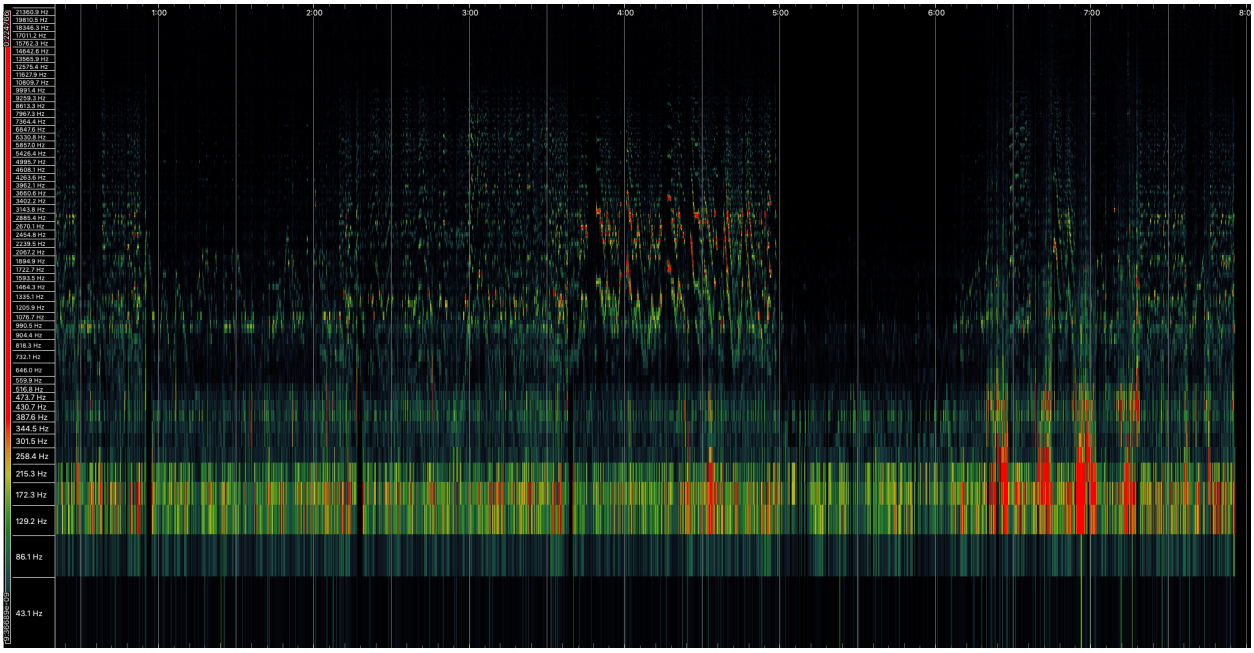

Figure 7.7. Chick Corea's recording: frequency (Hz), time (minutes), intensity (colour).

From these macroscopic perspectives, two differing utilizations of frequency range are evident and confirm aural impressions of the recordings. First, and most notable is Christian

McBride's relatively pronounced bass sound on Chick Corea's recording as compared to the 1949 session. Second, horizontal banding in the spectrogram of Corea's recording reveals a separation of instruments into carefully delineated emphases across its greater frequency range.

McBride's comparatively privileged bass sound is reflected in the 125Hz peak in figure 7.5 and the intense band across the bottom of figure 7.7. The relative lack of bass in Powell's recording is partially attributable to an inverse relationship between low frequencies and recorded length characterized by its medium. The greater the low frequency content inscribed to a record, the wider the grooves. This results in a reduction of possible recording length. The peak spectral analyses and spectrograms seem to indicate the use of high-pass filters on both recordings. Corea's recording, however, indicates a more gradual slope with low frequencies emphasized and reaching about an octave lower than Powell's.

In chapter 5, I assert that McBride's pronounced bass sound allows Chick Corea to voice chords differently from Powell. In many instances (including those analyzed in chapter 5) Powell is heard to play the roots of chords low on the piano. In contrast, Chick Corea largely avoids the bass register. More significantly, however, is the voice given to the bass player. As heard in Corea's recording and outlined in figure 7.1, McBride is featured equally to all other musicians as an improvised soloist.

The significance of a changing aesthetic, exemplified by McBride's privilege, is reflected in Ron Carter's (the most recorded bass player ever) acknowledgement that: "Bass players in the '50s were just accompanists, but since then you can hear bassists who are guiding the direction of music."[120] Carter, whose career spans for over sixty years at this point states: "The advent of pick-ups and better sound-reproducing equipment… makes a bass player much more audible than fifty years ago."[121] Edward Varèse states: "Electronics is an

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[120] Ron Carter, *Ron Carter: Finding The Right Notes,* written by Dan Ouellette, (New York: ArtisShare, 2008), 392.

[121] Ron Carter, *Ron Carter on the evolution of jazz bass and how "guys are writing more difficult parts" these days,* interview by Jon Solomon, October 24, 2012. https://www.westword.com/music/ron-carter-on-the-evolution-of-jazz-bass-and-how-guys-are-writing-more-difficult-parts-these-days-5691723

additive, not a destructive, factor in the art and science of music."[122] In this case, it is clear that the voice given to Christian McBride is attributable to electronics as an additive factor.

Corea's recording likely utilized multi-track techniques that included close mic-ing of individual instruments. Not only does this contribute to the audibility of the bass, but to the transparency of the recording overall. By multi-tracking instruments with individual microphones, equalizers and compressors can be used to emphasize specific timbres. Each instrument is given a spot within the listener's attention. These emphases are indicated by the pronounced horizontal banding in figure 7.7. Careful examination reveals each instrument's spot within the frequency range. In comparison, the spectrogram of Powell's recording in figure 7.6 indicates less delineated frequency banding. Although the instruments are identifiable by frequency range, these ranges are less clearly defined and correspond to a lack of aural clarity in the recording. Indications of high intensity in Powell's spectrograph also correspond with audible distortions.

The large frequency range and separation of instruments by frequency emphasis heard in Corea's recording also affords Roy Haynes' use of the ride cymbal during the piano solo. On many bebop and jazz albums from 1930's and 40's it was common for the drummer to switch to hi-hat for piano solos. This is the case in Powell's recording. This accommodation to a piano's relative low volume and its similar frequency range to that of a ride cymbal, however, had additional consequences. Haynes' switch to hi-hat on Powell's recording is accompanied by a change of time feel (lope) and a lack of rhythmic interaction. The rhythmic synergy and interaction between Chick Corea and Roy Haynes, heard on the 1997 recording, would have been unimaginable to listeners of recorded jazz from the mid-century. The technological fidelity of Corea's recording affords a previously unheard voice to the bass *and* the piano.

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[122] Edgard Varèse, "The Liberation of Sound," *Audio Culture: Readings in Modern Music,* (New York: Bloomsbury, 2004), 19.

7.4 Spacial Image

Figures 7.8 and 7.9 are snap-shots of a vector audio scope and a correlation-meter taken from each recording. In considering the spacial images of each recording, the disparate potentialities privileged by their technological mediation are noted.

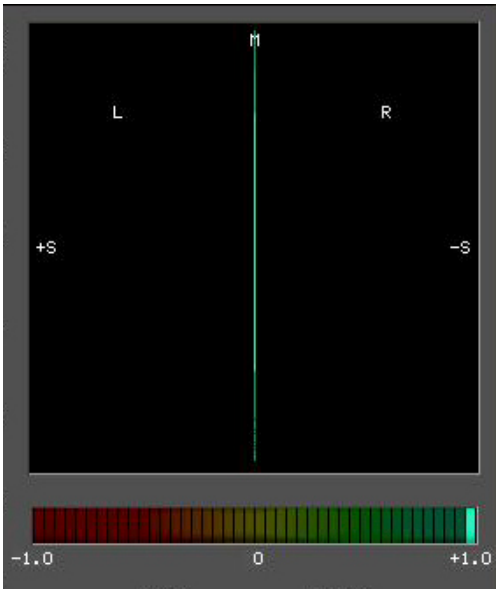

Figure 7.8. A vector audio scope and correlation meter of Bud Powell's recording.

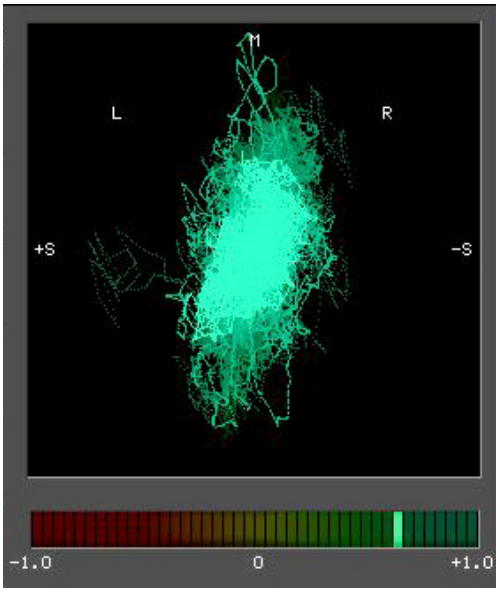

Figure 7.9. A vector audio scope and correlation meter of Chick Corea's recording.

Figures 7.10 and 7.11 plot the utilization of stereo image over the duration of the recordings. The Y-axes indicate the proportion of signal energy present in the left and right channels. A signal at the furthest left stereo position is indicated at the lowest point of the Y-axis. A signal at the furthest right stereo position is indicated at the highest point. A signal that is evenly distributed between left and right is indicated at the mid-point of the Y-axis. The X-axes plot time in minutes.

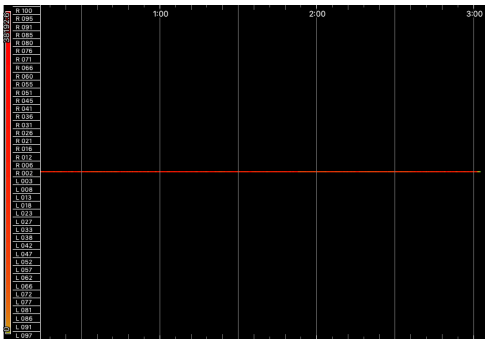

Figure 7.10. A stereo plan of Bud Powell's recording.

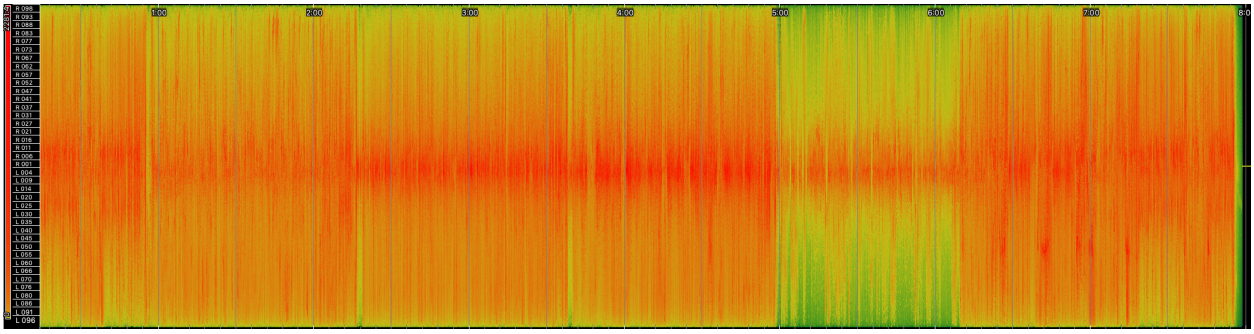

Figure 7.11. A stereo plan of Chick Corea's recording.

Much like the delineated and emphasized spots within the frequency range discussed in section 7.3, figures 7.9 and 7.11 reveal the potential in Corea's recording for each instrument's positioning within a stereo image. In contrast, figures 7.8 and 7.10 reveal only one stereo position: centre. As Powell's recording is mono, its playback on a single speaker would place every instrument at the same spot. The playback of Powell's mono recording on a stereo

system would send the same signal in equal proportions to left and right speakers. A listener would perceive the image as centred between the speakers in a similarly finite spot.

A notable characteristic illustrated by figure 7.11 is the stereo image of the drum set. A reduction of energy from the far left and right is visible during the bass solo (beginning about 5:00). This reduction corresponds to Hayne's switch to hi-hat and his reduced dynamic and rhythmic activity. In contrast, the rest of the stereo plan indicates the prevalence of drums and cymbals imaged from far left to right at relatively high amplitudes. The continuous band at the mid-point of the Y-axis in figure 7.11 also reveals the emphasis given to the bass on Corea's recording.

A subtlety to this analysis is a distinction between stereo image and spacial image. A mono recording can convey some spacial image but not stereo image. That is, the perception of distance communicated either by the amplitude of an instrument, its distance from a microphone, or reflected sounds that human cognition can decode, contribute to a sense of spacial image. This sense of spacial depth is a potentiality of mono recordings. A stereo image corresponds with the space between two speakers from left to right. Figures 7.12 and 7.13 map my subjective images of "the space between the speakers."[123] Amplitude and distance are generalized to be equivalent and are illustrated by relative size.

In addition to stereo image and amplitude (distance), these maps also convey a qualitative sense of frequency. In many ways, they are the culmination of the analysis so far as three of the four recording characteristics in my analysis are included. In figures 7.12 and 7.13, dynamic range is conveyed by relative size; frequency range is conveyed on the Y-axis, and stereo image is conveyed on the X-axis.

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[123] David Gibson, *The Art of Mixing: A Visual Guide To Recording Engineering and Production,* 9.

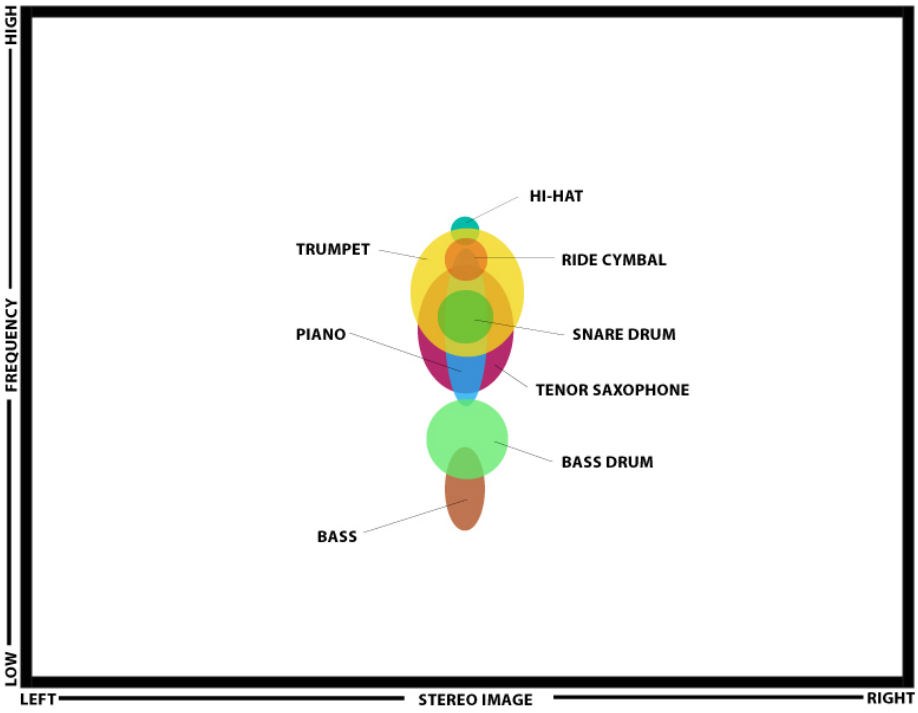

Figure 7.12. An image map of Bud Powell's recording.

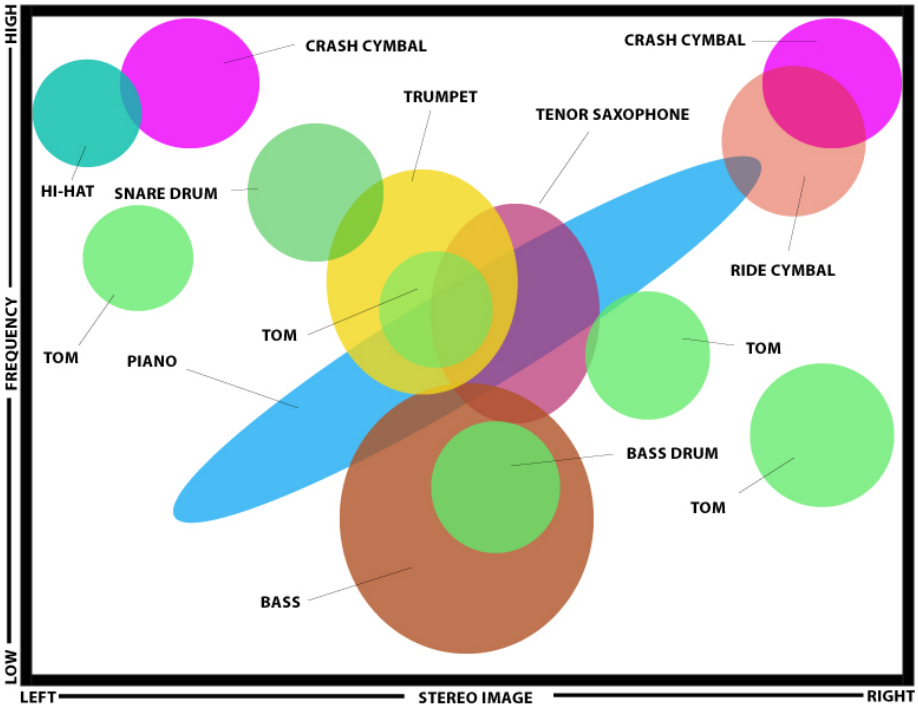

Figure 7.13. An image map of Chick Corea's recording.

As illustrated in figure 7.12, Powell's mono recording of limited frequency range places all instruments in a similar spot. In figure 7.13, the stereo image of Corea's recording further separates and delineates the instruments. This separation, afforded by the stereo image, allows a listener to shift attention from instrument to instrument. This increased aural transparency is reflected in instrumental hierarchies. In Powell's recording, a clear hierarchy delineates soloist from accompanists. In Corea's recording, a transparent and interactive approach to accompanying is heard. At any moment an accompanying instrument can interject musically and move to the front of the listener's attention. This conversational interchange of melodic and rhythmic motifs contributes to the music. This characteristic is afforded by the image of the recording as well as its utilization of frequency range.

I argue that many of the different musical characteristics heard when comparing Corea's 1997 recording with Powell's 1949 recording, connect to disparate potentialities afforded by their respective mediations. Powell's abbreviated forms, Corea's chord structures, changing musical hierarchies, approaches to accompaniment, bass as a privileged instrument, rhythmic interactions with the drums, etc., are all shown to connect to recording characteristics. Understandings such as these only arise by considering jazz's technological mediation. Additionally, the inclusion of analytical methods beyond those privileged by western notation, reduces the barrier that may exclude many non-literate music forms from musicology.

Chapter 8 - Conclusions

By integrating the analysis of technological mediation to perspectives of jazz music, I aim to broaden my understanding. Important issues of authorship and related work-concepts, authority, and cultural transmission have revealed themselves through this process. I propose that recordings will continue to be important texts for future musicologists. The inertia that sees a continued privilege of literate music and a focus on scores is exemplified by Michael Cherlin's assertion that: "No composer was more responsible for changes in the landscape of twentieth-century music than Arnold Schoenberg."[124]

I vehemently disagree. Not to diminish Arnold Schoenberg's contribution, but Cherlin's definitions of "composer" and "music" must differ from (and possibly exclude) mine and many others. Perhaps I will appropriate the term "music" to refer only to jazz music, and any other forms will therefore need to be further modified or qualified, eg. fill-in-the-blank music. My need to qualify jazz music as "transmitted primarily through aural and oral means" also points to the possibility that music is being discussed (perhaps erroneously) as distinct from sound and separate from culture.

I imagine future musicologists listening to, and considering not only jazz recordings but the recordings of composers such as Bob Dylan, Stevie Wonder, Joni Mitchell, Dr. Dre, Joanna Newsom, Cardi B, and others. It's possible, however, that the analytical tools needed to objectify the brilliance of these composers are not yet fully developed. It's also possible that this isn't required. Michel Foucault asserts that: "In every society the production of discourse is at once controlled, selected, organized and redistributed by a certain number of procedures whose role is to ward off its powers and dangers, to gain mastery over its chance events, to evade its ponderous, formidable materiality," adding that "the madman has been the one whose discourse cannot have the same currency as others."[125]

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[124] Michael Cherlin, *Schoenberg's Musical Imagination,* (Cambridge: Cambridge University Press, 2007), 1.

[125] Michel Foucault, "The Order of Discourse," *Untying the Text: A Poststructuralist Reader,* ed. Robert Young, (London: Routledge, 1981), 52-53.

Cherlin further states of Schoenberg that: “No other composer’s music inspired a commensurate quantity and quality of technical description” and “scholars without an understanding of the formidable musical technique are ill-equipped to understand the music with any profundity of thought.”[126] Again, I believe the criteria being used to determine the relevance of a composer and their music, what music is (in a fundamental sense), as well as whose perspectives are relevant, are significantly different than mine.

I propose that the objectification of knowledge is a powerful tool in the control of discourse that uniquely privileges literate sources. Following Gary Tomlinson who questions “the findings of twentieth-century, Eurocentric musicology as comprehensive,”[127] perhaps alternate theories of knowledge will be considered along with non-European music. This could include knowledge as immaterial and unknowable in any way in which it can be gained, possessed, or sought after. This is exemplified by the Taoist or Buddhist notion of negative knowledge or “knowing what is not so.”[128] In this case, I don’t know what music is, but by studying it I gain a sense as to which notions of it are inadequate.

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[126] Michael Cherlin, *Schoenberg's Musical Imagination,* 1.

[127] Gary Tomlinson, "Monumental Musicology," *Journal of the Royal Musical Association*, 350.

[128] Alan Watts, *The Way of Zen*, (New York: Vintage Books, 1957), 37.

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